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MODEL AIRPLANE NEWS

OCTOBER 1957—35 CENTS

Howard Bonner and Bob Palmer back from barnstorming tour of South Africa. See page 10.

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Complete with Herkimer 1/2A .049B Gas Engine with "Auto-Recoil" Starter

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Comet's inspired U-Control SCALE GAS MODEL of the fighter plane that made history! Big—beautiful—truly ready-to-fly—needs no "building!" High-impact plastic in a striking two-tone color scheme, complete with engine and starter, in a handsome chest. Big 16" wingspan—and a terrific value!

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Nothing to build—Ready-to-fly

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INTERNATIONAL COMPETITION NEWS

► At this writing we are informed that possibly three of the four USA Nordic team members might make the trip to Czechoslovakia, and it is possible that the fourth model might be proxy flown by an American making the trip as team manager. From this we can see that intense interest must prevail among the team members for them to take the time, effort, and money to do such a thing. It also ups our country's chances for success by having the team there in person. The Finals for Nordic will be held at Mlada Boleslav which is near Prague. The dates are August 7-11. The Speed team's models will be proxy flown.

An information and application sheet was distributed to interested persons at the 1957 Nationals. The IC Committee was on hand to answer questions regarding the trip and how it will be possible for the teams to go to the 1958 Finals. Down payments will be accepted from AMA members only. Outsiders will not be permitted to sign for the trip. About 55 seats will be sold to members. Payments must be made in full by May, 1958. If, for any reason, the charter plane trip does not come about, all money will be refunded. Success of the trip depends on the US modeler and his support of the project by buying a ticket.

At time of this writing 50-gram Wakefield models are popping up all over the place. Many modelers are surprised at the good performance. More than half of the models we have seen have been 80-gram models with shortened motor bases. The opinion of many of the top fliers is that a little more attention must be given the propeller to eke out the last bit of performance.

Power and Wakefield semi-finals for selection of the 1958 team will take place September 28, 29, at four centrally located sites. These are expected to be the same sites as used for the June Nordic Semi-finals, except on the east coast where flying will be transferred to Solberg Airport near Somerville, N.J.

NORDIC A/2 GLIDER TEAM

Patrick Hoadley, 908 E. 3rd St., Bloomington, Ind. Edward Christenson, 400 E. 23rd St., Lawrence, Kan. Gerald Thomas, 503 East Wright, Tacoma 4, Wash. Jim Daley, 196 Harwood Ave., Littleton, Mass.

F.A.I. SPEED TEAM

Bill Wisniewski, 4261 Petaluma Ave., Long Beach, Calif. Arnold Nelson, 3803 Stevely Ave., Long Beach 8, Calif. Fred Cook & Jim Clem (team), 3924 Hickory Tree Road, Mesquite, Tex. Floyd S. Bradford, 4937 Verduraave, Lakewood 11, Calif.

Ed Dolby
International Competition Committee

29th Year of Publication

M.A.N.

MODEL AIRPLANE NEWS

JAY P. CLEVELAND, President and Publisher

OCTOBER 1957 Vol. LVII, No. 4

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ARTICLES

FEATURES

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WITTICH HOLLOWAY, Art Director

Contributing Editors: Peter Chinn (England), Don Grout, Ed Lorenz, Ted Martin, Bruce Wennerstrom, Harry Williamson

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by William Winter

► Time changes everything. It is changing the model business. When things change because of progress or a new and better way of doing things, man inevitably must accept the new for, otherwise, we'd be riding in wagons and flying twin pushers. But change also can be a trend, impersonal, good or bad, as unmoving and moving as a glacier.

In last month's thrilling installment, the mustachioed villain had tied the stick-and-paper stepping-stone projects to the sawmill log. Will he throw the switch? Man at Work, optimist, is sure some hero will shoot the wretch—the villain, that is, in case you're having trouble keeping this crate in sight. Hissing the villain is not enough, as now will be proved by an impartial commentator, not a member of this round table, and a Canadian to boot. Writing in the Ottawa Citizen, Don Brown, Staff Writer, puts this problem in terms no one can ignore, be he modeler, manufacturer, or supporter of the once valid thesis that models build careers, in aviation, and for the country.

"It might appear incongruous," he begins, "but airline and aviation manufacturing officials are worried about the decline in the popularity of model plane building and flying.

"In some sections of Canada, particularly the west coast where model aircraft activity once flourished, the young boys of today are turning their energies to other hobby fields.

"This development is so concerning aviation authorities," Brown continues, "that at least one of the large commercial transport firms is considering contributing a considerable sum to finance trophies and competitions to reactivate the interest in the model plane field.

"Why are they so concerned? Well, in the past the airline operators and aviation firms have employed quite a number of aircraft designers, engineers, architects and aircrew members who graduated from the youthful pastime of model airplane building (where they first gave expression to their interest in aviation) to college courses and then into the industry.

"Their employers," states Brown, "have found them to be excellent workers and attribute much of this enthusiasm for their vocation to the basic introduction they received in their model building days.

"Now, with the industry going through a tremendous expansion it can use young men with such a background but in many the (*Continued on page 7*)

NEXT MONTH'S COVER

ON THE COVER

Just before taking off for Africa via Sabena, Howard Bonner and Bob Palmer, ace radio and stunt modelers respectively, happily posed for this color photograph by Bob Morgan. All expenses paid by Jix Ltd., South Africa, the boys barnstormed 30,000 miles. What happened on this model aeronautical tour of good will is recounted by Bob Palmer in this issue.

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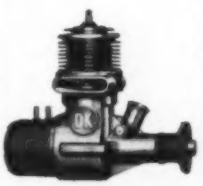

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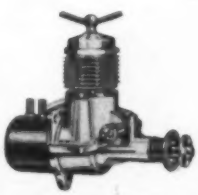

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Pint 85¢

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86 HARTER STREET HERKIMER, NEW YORK

MAN at Work

(*Continued from page* 4)

basic qualities gleaned from the intricate and absorbing pastime of model building and flying are missing.

"This is not to say that graduates without such hobby background are not qualified and capable personnel," wrote Brown in the Citizen, "but the air industry officials, many of them former hobbyists, are of the opinion that such activity provided an excellent background.

"Officials are somewhat at a loss to pinpoint the principal cause behind the present day doldrums in model airplane activity. One explanation, which might be the major one, is the advance in airplane design. There was considerable plane designing and building among the young fry in the glamorous trail-blazing days of the strutted and wired biplanes, the lumbering Ford tri-motor transports and the Keystone bombers of the late 1920's.

"There was a challenge to cutting balsa wood struts and binding them together with glue and wire, then covering the fuselage and wings with shellaced cloth. It represented hours of interesting work, and the finished product made the owner the envy of the neighborhood

"Today," Brown goes on, "all an air-minded youngster has to do is go down to the nearest dime store or hobby shop and buy a precast plastic model which can be assembled in a matter of a couple of hours, at the most.

"Also, the planes of today with their sleek supersonic lines don't seem to excite the present generation to the hours of voluntary work demanded by the earlier designs.

"It appears," Brown winds up, "that the demand for bigger and faster planes has left the hobby behind and the industry is concerned because of it."

You may argue with Brown's or the Canadian aircraft industry's opinions why boys are not building as many of the more difficult flying models as they did a few years ago. Or even that such modeling in the states is in the dire straits it is in above the border. Because MAN has become a citadel for the earnest airplane modeler, its place in the field is stronger than ever—and that covers nearly 30 years. Success, however, should not blind any of us to the big picture, which is that where millions of boys once learned, and loved, to build and fly model aircraft, their opportunity to do so today has been drastically curtailed, and through no fault of their own. It is not that boys don't want to build such model aircraft—and many of them succeed despite the road blocks—because they do, as evidence by their demands for information on how to go about this mysterious business of getting started.

One cannot quarrel with the dealer or manufacturers in general for their other interests, any more than you can criticize the druggist for selling ice cream sodas, newspapers, cigars, and beach umbrellas. But we sure would cuss out the druggist if he treated the prescription department with indifference.

Why is it that hobby shops are always out of anything you want at a given moment? How come the jobbers don't have what we want? When a dealer must chase seven jobbers for a standard, popular model builder's item, the wings have got to fluttering. An encouraging number of firms show by their ads in this magazine that they know the build-a-plane hobbyists exist. But this fine hobby of building and flying model airplanes, the very cornerstone on which the hobby shops were built, will not reach its rightful potential if all members of the trade are not indoctrinated in its value, past, present and future.

• • •

► Jim Wilson, a happy fella out of Overland, Mo., says that if the hobby was one tenth as sorry as it is cracked up to be, we'd all have given up ten years ago. "One of the favorite gripes," sez he, "is that the hobby is supposed to be in a rut—no progress, etc. Another that it isn't attracting newcomers, especially younger ones. Both of these ideas are all wrong!"

So Jim points out progress since 1940. Engines that cost $25 to $30, now cost $5 to $15. Once two bucks, props now are 25c. Insurance for $1.50 to $2.50 a year. It usta was $7.50 to $10. Today's kit is one-third the cost. Speed jobs fly twice as fast. Indoor gliders topped one minute and the "mike" jobs a half hour. Glow plug, U-control Mono-Line, dependable radio.

• • •

Juniors? Look around at any contest, Jim suggests and goes on to say, "A lot of Sad Sacks think that every youngster who tries his hand at models, should take up the hobby for keeps. That, if some of the newcomer s quit, that there is something wrong about today's kits.

"Don't they realize that some guys don't want to build models? They try it—don't like it. Would rather play ball, collect coins, or watch TV. I'd like to go on record as one guy who likes the show the way it is —and, I'll like it the way it will be next year, too."

Dig you, Jim Wilson. Let's keep it that way.

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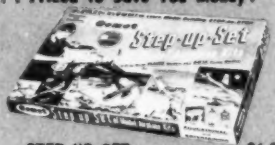

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Kit Q-8 Ryan Navion
Kit Q-9 Globe Swift
Kit Q-10 Curtiss Robin
Kit Q-11 F51 Mustang
Kit Q-12 Super Sportster
Kit Q-13 F84 Thunderjet
Kit Q-14 F86 Sabre Jet

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Kit R-6 Yellow Vengeance
Kit R-7 Piper Cub
Kit R-8 Ercoupe
Kit R-9 Sportsy
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Kit R-11 Grumman F9F Panther

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M-3 Aeronca Sedan
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M-7 P51D Skyknight
M-8 F9F-6 Cougar
Kit M-9 No. AM. F51 Mustang

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Kit Y-2 A26 Invader
Kit Y-3 P47 Thunderbolt
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Kit Y-7 F9F-6 Cougar
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By posters, handbills, newspaper ads, Jix Ltd., whipped up the successful promotion. In Pretoria Arena as exhibition goes on.

TWO BY AIR

by BOB PALMER

Barnstorming through South Africa—stop over in England, Howard Bonner and Bob Palmer demonstrated American radio and stunt model flying.

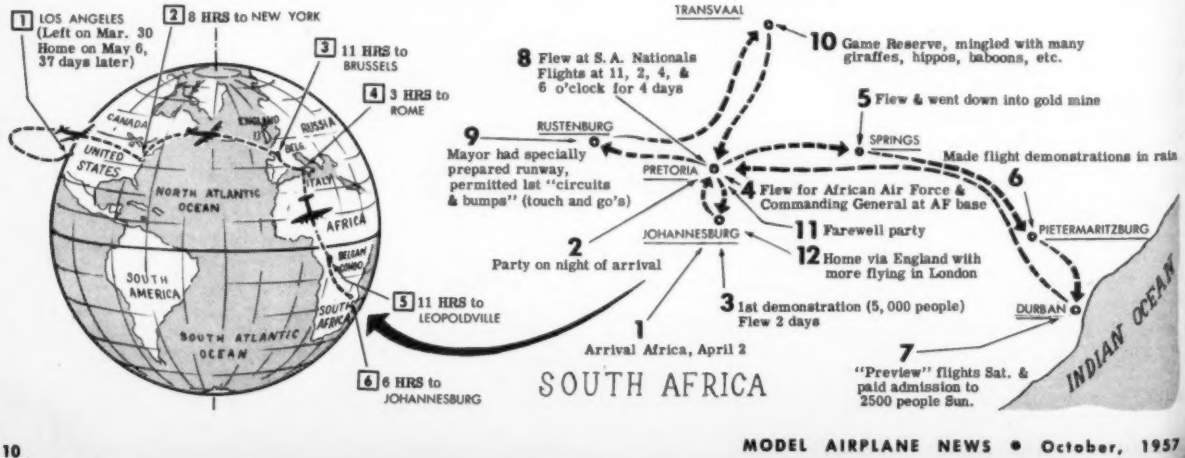
Never before has high-performance model flying been used in such a big way to attract the general public to the hobby. Here's the complete story, an MAN exclusive.

► An invitation to travel 30,000 miles with Howard Bonner to make a demonstration tour through South Africa, was one thing I never expected to come from my hobby of building and flying model airplanes.

This was the first foreign travel for either Howard or myself, and it was the first time model flying had ever been used purely as a spectacle for such large scale public demonstrations. We learned a lot about exhibition flying, saw new ideas on modeling, new ideas on the African hobby shop business, and squeezed in a lot of sightseeing in our 37 days of travel.

The story of how the African tour "happened" began back in 1949 when Monte Malherbe (in South Africa) began exchanging letters with me about one of my early U-control designs, based on the then new ideas of using a small engine on a large-span, light-weight airplane, and using wing flaps connected to the elevators for tighter maneuvers. Monte soon became an enthusiastic modeler, and built many planes. He came to like models so well that he plunged into starting a hobby shop of his own. This

Flying Sabena, stunt-RC "team" covered 30,000 miles in 37 days, put on as many as four exhibitions a day—once for four days.



After flying before 3,000 on Duke of Bedford's estate, England, Howard explains ship to Duke.

Monte Malherbe, center, greets Bonner in Johannesburg. Impressed on US visit Monte had idea!

Crowd-pleasing stunt was Palmer's stunting without watching model—one time flew blindfolded.

first shop expanded, other shops followed, and now, just eight years later, Monte runs the chain of new stores known as Jix Limited. Monte is general manager of the chain and a director. The other directors are F. Sturdy and E. Allen.

In May of '56 Monte visited the United States, and was amazed at the spectacular aerobatics that were being performed by control-line and radio-control models. Monte immediately thought he'd like to show this type of flying to the people back home so, armed with movies and enthusiasm, he went back to talk up the idea of Jix Limited sponsoring a tour of American modelers through Africa. Finally, in September of '56 Monte wrote that Jix had decided to go ahead with the tour, and he asked if I could come and fly control line and if Howard Bonner could come and fly radio control. Originally, they'd wanted four modelers to come, but since this was the first trial of such a new-type promotion, they'd settled on two.

I applied for a leave from my job as a wind tunnel, model builder at Lockheed, and Howard arranged to be absent from his manufacturing business. We rushed into building and testing new models, getting visas, shots, building crates, etc., and on May 29th we left from the Los Angeles International Airport. We stopped in New York, Brussels, Rome, and Leopoldville in the Belgian Congo.

In Brussels, the first thing we did was to get lost trying to find our hotel. We kept asking directions and the long explanations in foreign language didn't help at all. It's a strange experience to be lost in a city of thousands of people who can't speak English.

On arrival in Johannesburg, we were met by Monte who was quite excited to see his plans of a year ago begin to work out. He drove us 20 miles to a party in Pretoria. At the party, it seemed as if everybody we met were either model builders or followers of the sport. We talked a lot about RC systems, setting relays, etc., and RC flying was just beginning to get popular. In control line, the African rules had no square 8's, no triangle, and consecutive maneuvers were never performed. However, their rules are going to be changed soon to be the same as in the United States.

In Africa, they take a lot of interest in beginners. After selling a kit to a beginner, somebody from the hobby shop will usually take the beginner out to fly and they are careful not to sell an advanced model to a beginner. They have a good arrangement of combining the hobby shops and toy stores so that older members of the family can be shopping for models, while the recreational needs of the youngsters can be taken care of at the same time.

Another thing we noticed was that everybody in the hobby business enjoyed building and flying models, no matter what age they were, or whether they were a dealer or a top executive in a distributor set-up. I think this makes for much more enthusiasm in the business, and makes for a faster expansion. Models are thought of as being a lot of fun, rather than a profit or loss item. The true spirit of modeling is more appreciated and spreads faster.

After a day of rest, we were scheduled for early demonstration flying in Johannesburg. While we were getting the models ready, Monte rushed in to say that a huge crowd of spectators were waiting impatiently. His advance promotion with posters, handbills, and newspaper ads had worked and how! Now it was up to us. We quickly loaded the models into (*Continued on next page*)

With storage battery ready, Palmer fills up Thunderbird, using squeeze bottle for pump. This, pic top left, from Aeromodeller.

Bob, left, and Howard with two dependable crates. Alternate stunt, RC flights held crowd interest.

TWO BY AIR—continued

his car and eased through the crowd. We started making flights as quickly as possible. As soon as I would land my control-line model Howard would have his engine running to immediately start demonstrating RC. The strain of exhibition flying is a lot different from contests, where the rules are made to please modelers, not general public spectators.

When the crowd applauded at my square eights or Bonner's low altitude rolls and spins, we followed the cue and gave them more of the same. The object was to keep things moving constantly so that spectators who had no previous interest in models would not have a chance to get bored, even for an instant. RC and U-control is a good combination, for demonstrations, because UC takes place in close, with tight maneuvers, while RC provides a change of pace with larger, more remote maneuvers, and passes over the crowd. On every flight in RC Bonner went through all spectacular stunts, including true spins, snap rolls, inverted flying, and outside loops. The things the crowd liked best in control line were the consecutive square eights, landing at the same spot where the model took off, and performing stunts while looking away from the model.

The announcers played this up by saying "Look, he's done this so much he doesn't even have to look at the model" and invariably applause would follow. The trick backfired eventually as the crowd kept asking me to make a flight blind-folded. I finally tried it at the last exhibition, and it was the strangest experience I'd ever had. Not being able to see the horizon is very confusing, and after a few laps I started getting quite dizzy. I made some consecutive loops to ease this, but I was very happy when the engine quit and the model landed in one piece.

We made a total of around 100 exhibition flights on the tour, and the crowd response was always enthusiastic. Monte had hired sports announcers, and they helped a lot in keeping things going.

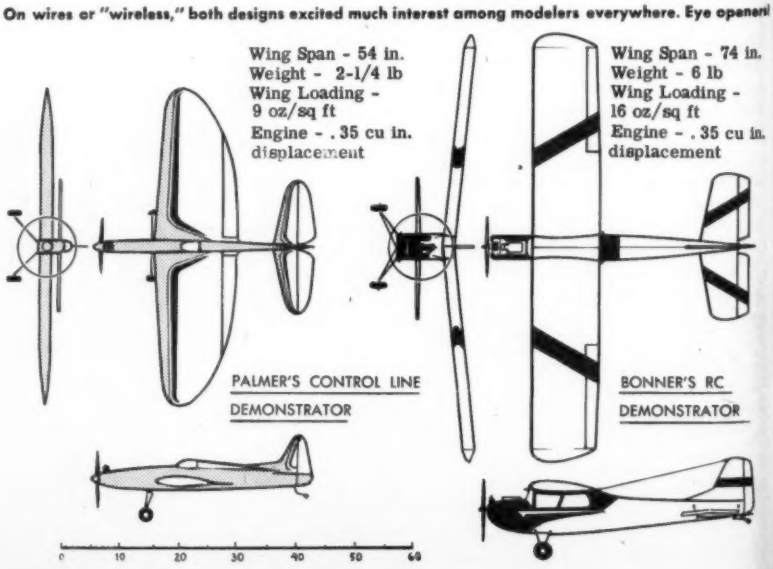
Paid admission to the field was used only in two cities. The main point was to get the general public into the area. After a few flights the announcer would suggest that those who enjoyed the show could help defray the sponsor's expenses by placing money in the hats of the girls that were circulating through the crowd, dressed in red. Then after more flying, the girls would circulate again and the announcer would say that perhaps the people who had not contributed before would like to do so now, and no one was expected to contribute twice, though often they did. This method of fund raising in crowds as large as 6,000 was highly successful, and possibly the costs of the tour were mostly repaid this way.

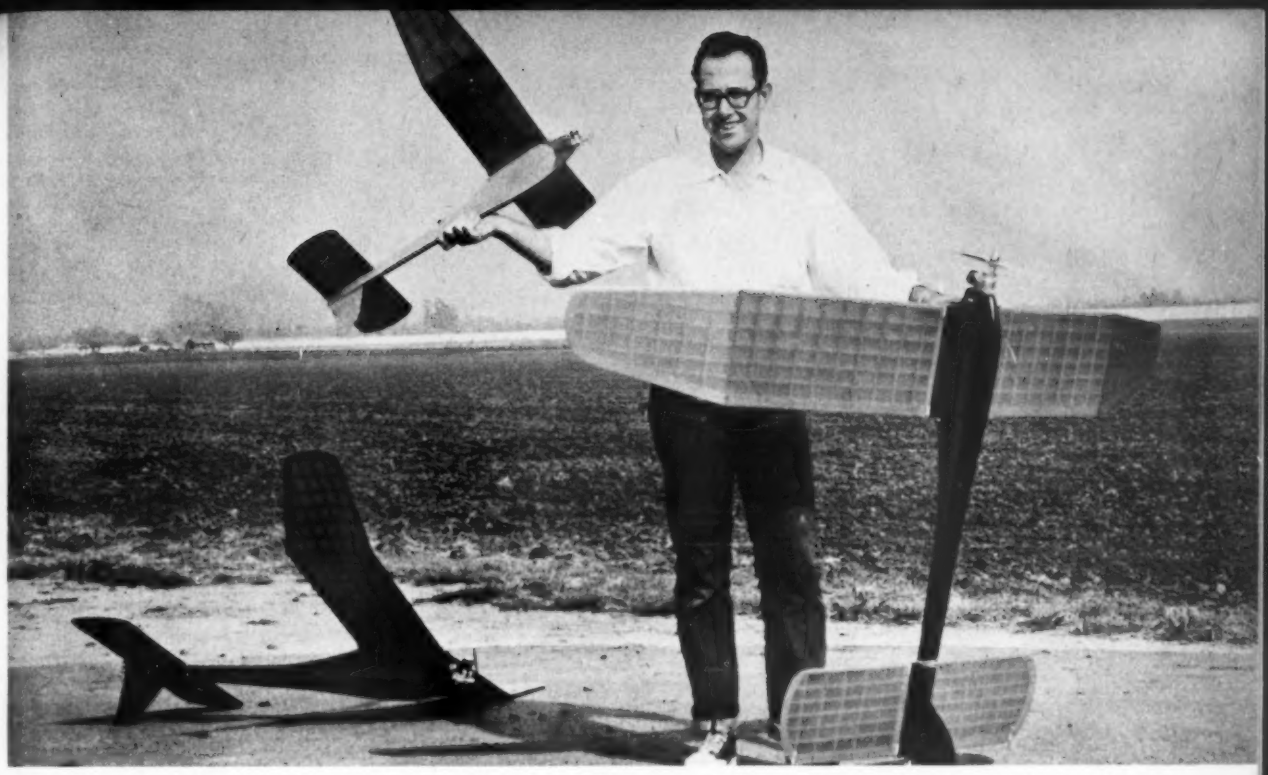
Between flight demonstrations in different cities, Monte arranged much sightseeing. We went down the shafts in a gold mine. (Gold and diamond mining is the principle industry of South Africa.) We drove through Kruger National Park in Transvaal, where we saw baboons, giraffes, hippos, and other wildlife freely wandering around in large numbers.

We were in Africa for 30 days, and were constantly touring and demonstrating, which put the pressure on both the airplanes and ourselves. Our standard equipment functioned perfectly and no flights were missed. Practically every evening Monte arranged some party or other event with the local modelers, and we enjoyed our spell of seeing the more casual way of life in Africa, in comparison to the faster pace of doing things in the United States.

One reason that modeling is expanding so fast in Africa is that a man never has to mow the lawn, paint the house, and perform the other tasks we have in the U.S. Every household has at least one and sometimes three native servants, which are hired full time for $12 a month. These native servants seem content (*Continued on page* 56)

On wires or "wireless," both designs excited much interest among modelers everywhere. Eye opener!





The A, B, C's of winning contests! Author displays Upstarts for all three classes: Half A in hand; A, left, and at VTO, the B-C combo.

the UPSTART

by PHIL KRAFT

One of the hottest Class C jobs on Coast, this Johnson-powered design handles power without those adjustment gimmicks.

Only the Sailplane type floaters can beat this glide but their climb is not comparable. Craft has strong right turn tendency under power.

Low fin, warped for left, then causes righthand climbing turn but a left rolling effect. This gives a vertical climb without loops, etc.

► Probably the most interesting and at the same time frustrating aspect of designing the contest free-flight, is the constant necessity of compromise. The requirements for maximum climb and maximum glide are simply not compatible in one aircraft. Structural ruggedness, reasonable simplicity, stability and serviceability all require some sacrifice in possible performance. Therefore, the merit of any design depends largely on how successfully it embodies all these factors with the least possible sacrifice in any single one. The Upstart is the result of the author's efforts toward minimum compromise in a contest free-flight.

This design combines possibly the fastest climb of any C-job on the West Coast with a glide equal or superior to all but the large Sailplane type floaters. To achieve this combination, an unusually clean fuselage is used with a higher-than-average aspect ratio wing and low-drag, flat-bottomed airfoil. As there is considerable controversy as to flat-bottom versus undercambered airfoils, the author built undercambered wings for the Half-A and A Upstart. The results indicated that a well designed ship with undercamber will outglide *CONTINUED ON NEXT PAGE*

Before cranking up and launching, Phil always lights the dethermalizer fuse. The structural design is rugged and simple. Ship very stable.

an equally well designed ship with flat-bottomed airfoil every time. However, the glide difference was not impressive and the much greater drag of the undercambered wing resulted in a tremendous loss in altitude achieved.

Along with the clean low-drag layout, is a force arrangement that produces a power pattern that gets the highest possible altitude. With the respect due any hot, fast free-flight, the Upstart easily will handle all the power available of the best engines without resorting to any radical power absorbing adjustment gimmicks. The fuselage side area and fin are arranged so that the aircraft has a very strong right-turn tendency under power. This is counteracted by warping the fin slightly to the left. Since the fin lies underneath the aircraft's longitudinal axis, warping it to the left produces leverage that tends to roll the model to the left opposite the inherent right power circle. The result is a model that climbs to the right but actually rolls to the left producing a vertical right-spiral climb that does not waste time in half loops or tight banking turns.

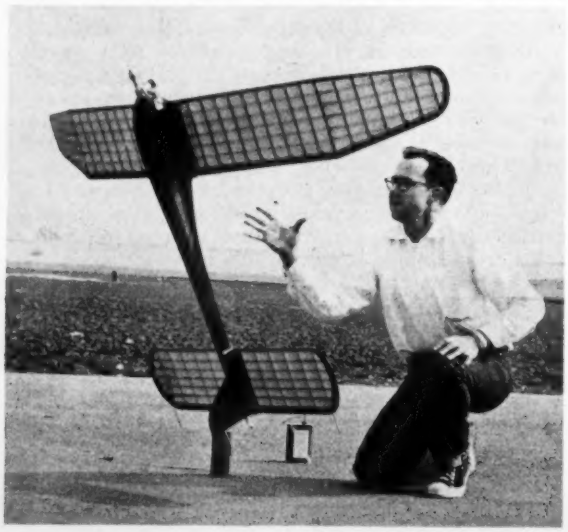
As is true with any good design, the Upstart may be scaled to any desired size without changing its flight characteristics.

The preceding constitutes the sales pitch for the Upstart. Actually, with any piece of competition machinery only one thing really counts and that is winning. This the Upstart does with a high degree of consistently taking first in three out of the last four class C contests entered with times of 32:31 OOS, 28:30 OOS, and 18:00.

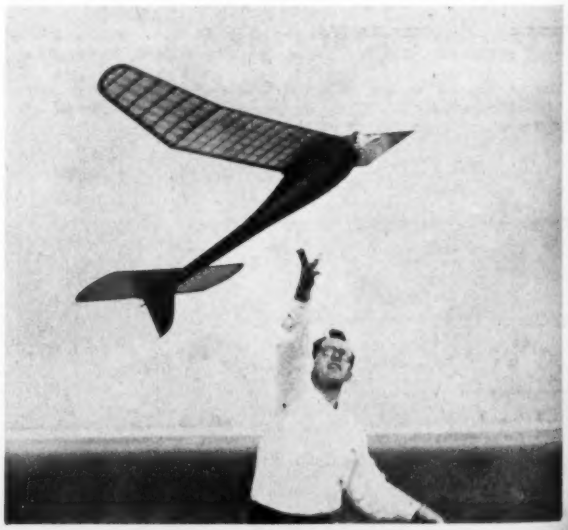
The wing and stabilizer should be completed first and allowed to cure while building the fuselage. Note that the center section planking of the stabilizer has the wood grain running chordwise. This is done to eliminate any possible flexing under the tension of the hold-down rubber bands. Wing construction is conventional except that cap strips are placed flat on the plan between the leading and trailing edge before the spars and ribs are cemented in place. This eliminates the difficulty of sliding the spars through the ribs and greatly strengthens the unit. Cover the wing and stabilizer with Jap tissue and dope till the paper is completely filled (about five coats at normal brushing consistency). Use nitrate dope, not butyrate.

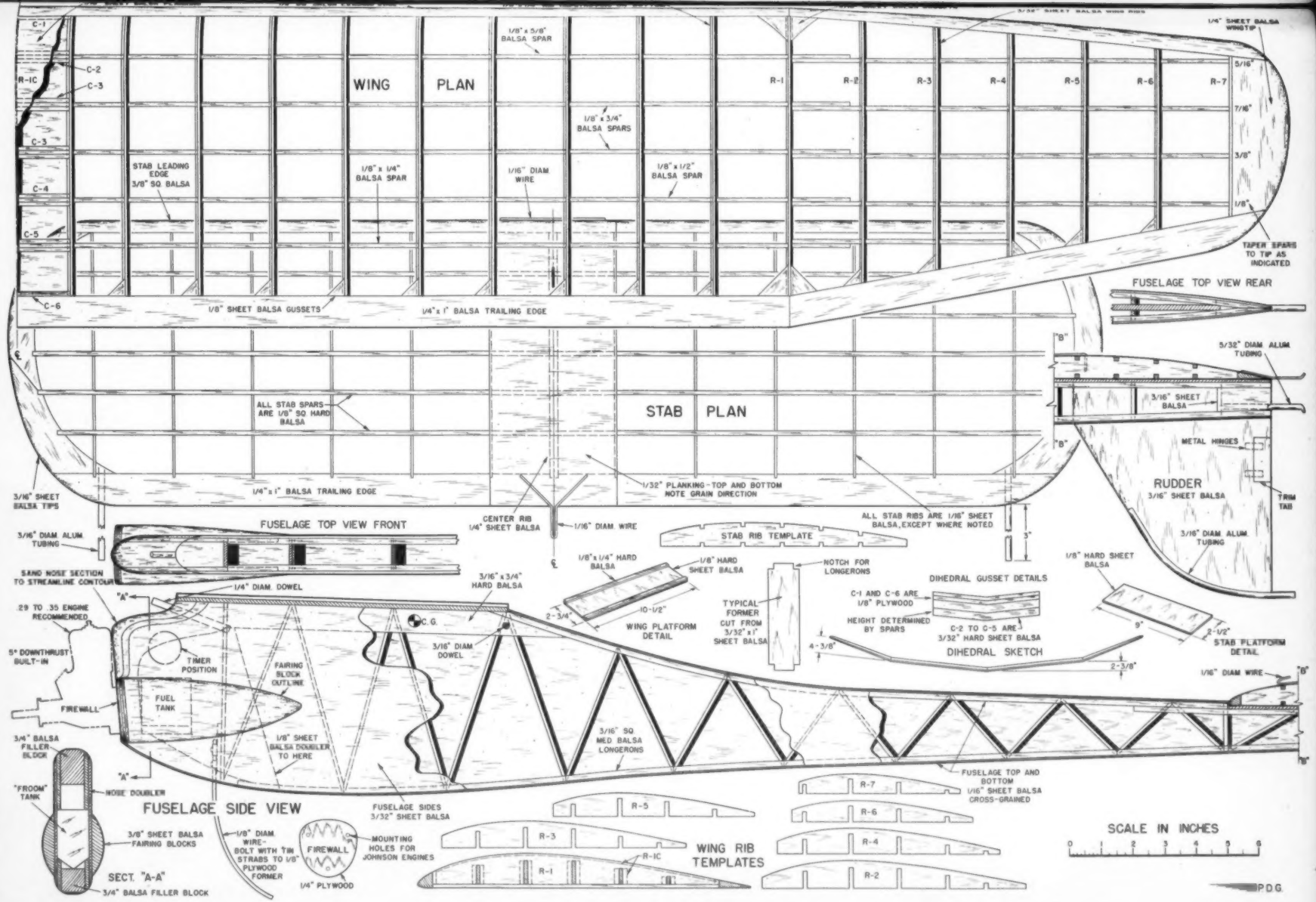
Fuselage construction is of a new type that results in an exceptionally high strength to weight ratio. Carefully select light, clear, straight-grained 3/32" sheet balsa for the fuselage sides. Use 6" stock if available or splice as necessary. With carbon paper (*Continued on page* 58)

For ground take-offs, the B-C version makes like a Nike. Multi-spar construction for warp resistance proved years ago—it's always good.



Or for hand launching, the Upstart goes up off your hand like an elevator. At 30-32 ounces, this design is a natural for .29's-.32's.





FULL SIZE PLANS AVAILABLE. SEE PAGE 56.

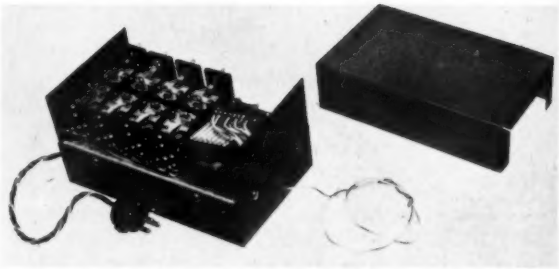
Radio Control News

by EDWARD J. LORENZ

Everyone wondered when CG would move into the eight-channel battle. This is the new X'mitter.

More about resistors, capacitors, chokes, for beginners who would savvy the ABC's of electronics. But if you can push a button, you can fly an RC job anyway. And all late news, developments, ideas, for "real gone."

Maxey Hester, Des Moines, begins proto take-off of a Smog Hog on his winning flight, Cedar Rapids. Dual proportional did it.



New, eight-channel CG receiver with typical arrangement of the relays and the eight-reed bank. Yes, it's for simultaneous use.

▶ For the past two months we've discussed resistors and capacitors and Ohm's Law. You must also know how to calculate the value of resistors and capacitors when they are connected in series and parallel. The first rule to remember is that resistors and capacitors are just opposite each other when it comes to figuring values in series and parallel.

Resistors in series are merely added together to give total resistance, with the voltage drop across each individual resistor totaling up to the applied voltage. Capacitors connected in parallel are also added together to give the total capacitance. The voltage breakdown rating will be that of the lowest voltage rating for any individual capacitor.

Resistors connected in parallel will always give total resistance of less than that of the smallest value resistor used. When two like resistors are paralleled, the resultant resistance is one half of the individual resistance. For example, two 1-meg resistors in parallel will give a resultant resistance of ½ meg, or 500,000 ohms. When two unlike resistances are connected in parallel, the resultant is found by dividing R_1 plus R_2 into R_1 times R_2. For example, if an 8,000-ohm and a 5,000-ohm resistor are connected in parallel, the resultant is 3,077 ohms. If more than two resistors are paralleled, the resistance of the group is found by using the following formula: $1/R$ equals $1/R_1$ plus $1/R_2$ plus $1/R_3$ etc. For example, a 4- , 7- and 10-ohm resistor are connected in parallel for a total of 2.02 ohms.

Capacitors connected in series are similar to resistors

in parallel, as far as calculating values is concerned. When two like capacitors are in series, the resultant is one half the value of the individual units. When two unlike capacitors are in series, the resultant is figured in the same manner as for two unlike resistors in parallel. When more than two capacitors are in series, the resultant is the reciprocal of $1/C_1$ plus $1/C_2$ plus $1/C_3$ etc. In other words, the sum of $1/C_1$ plus $1/C_2$ plus $1/C_3$ is divided into 1. For example, the resultant of a 300- , 500- and 800-mmf capacitor connected in series is 15-mmf.

The above calculations will assist you when figuring resistors used for limiting current flow or for "pushing" more current through a given branch of a circuit, for example through the relay branch. The capacitor formula(s) will assist when figuring a value to be used for "padding" a tank circuit or for relay-timing delay circuits. It should be pointed out again, that for a more complete coverage and explanation of radio and electronic components, their purpose and function, you should obtain a copy of The Radio Amateur's Handbook, available at most radio supply houses.

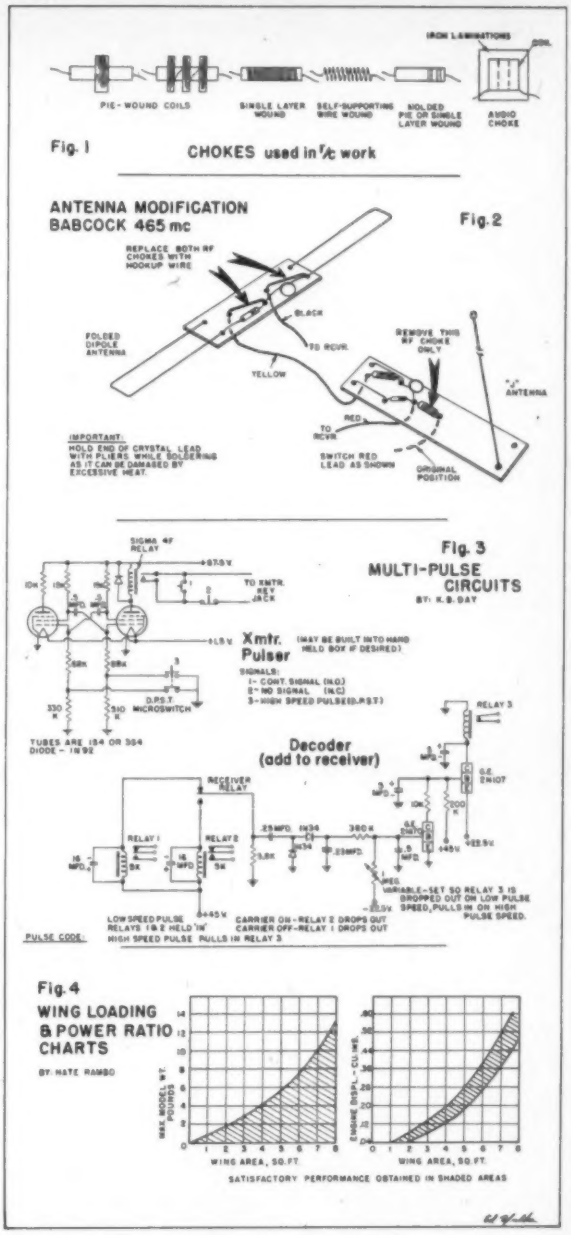
The next component to be discussed is the choke, or inductance. A choke is as its name implies, a device for "choking," or holding back, the alternating component of a voltage. Straight DC voltage is not affected by a choke, other than by the pure DC resistance of the winding. The unit of measure of a choke is called inductance and inductance is the property of a circuit which tends to prevent a change in current flow. This could be analogous to inertia in a mechanical set-up. Since an explanation of inductance would contain a great variety of variables, we shall not go into it in any great detail. Here is where a good book, such as we've mentioned, will help you.

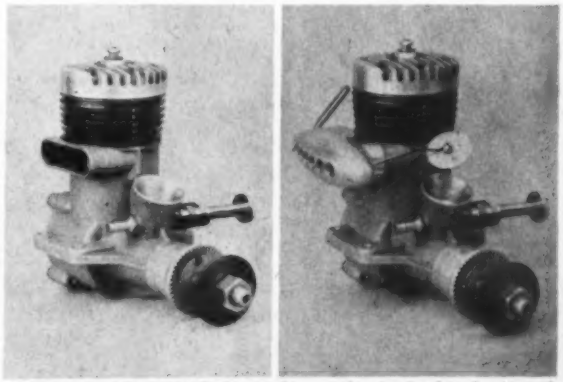
Basically, we have RF (radio frequency) and AF (audio frequency) chokes. Just as a resistor will limit the flow of DC current and a capacitor will act as an open circuit when placed in series with DC, a choke will block the flow of RF or AF and still permit the flow of DC. Inductance is rated in Henries, one Henry being the current change of one ampere per second, which produces a voltage of one volt. Hence, frequency is a determining factor in the size of a choke. For most radio-control work, the RFC (radio frequency choke) is relatively small, in the order of 1 milli-henry or less. Receivers usually require chokes of from 10 to 100 micro-henries, when used at 27 mc. The higher the frequency, the smaller the physical size of the choke. In fact, at 465 mc, the choke is but a few turns of wire, as compared to perhaps 100 turns for the same results at 27 mc. This column has stated many times that it is important to use the proper type of component when building a unit from plans, if you want the same results the designer obtained. This is particularly true of chokes, since many other variables enter into the design of a choke, other than the obtaining of a certain inductance value. The size of wire, number of turns, type of winding, and whether the wire was wound on an insulated core or an iron core, all determine the inductance value.

Chokes used for RF work are quite small compared to chokes used for audio work. AF chokes have special iron cores, or laminations, to produce a high value of inductance at relatively low frequencies. Fig. 1 shows some of the configurations of chokes encountered in RC work. Transformers, which are forms of inductors, will be covered in a later column. Next month we'll cover the basic fundamentals of a triode vacuum tube, such as encountered in detectors and crystal oscillators.

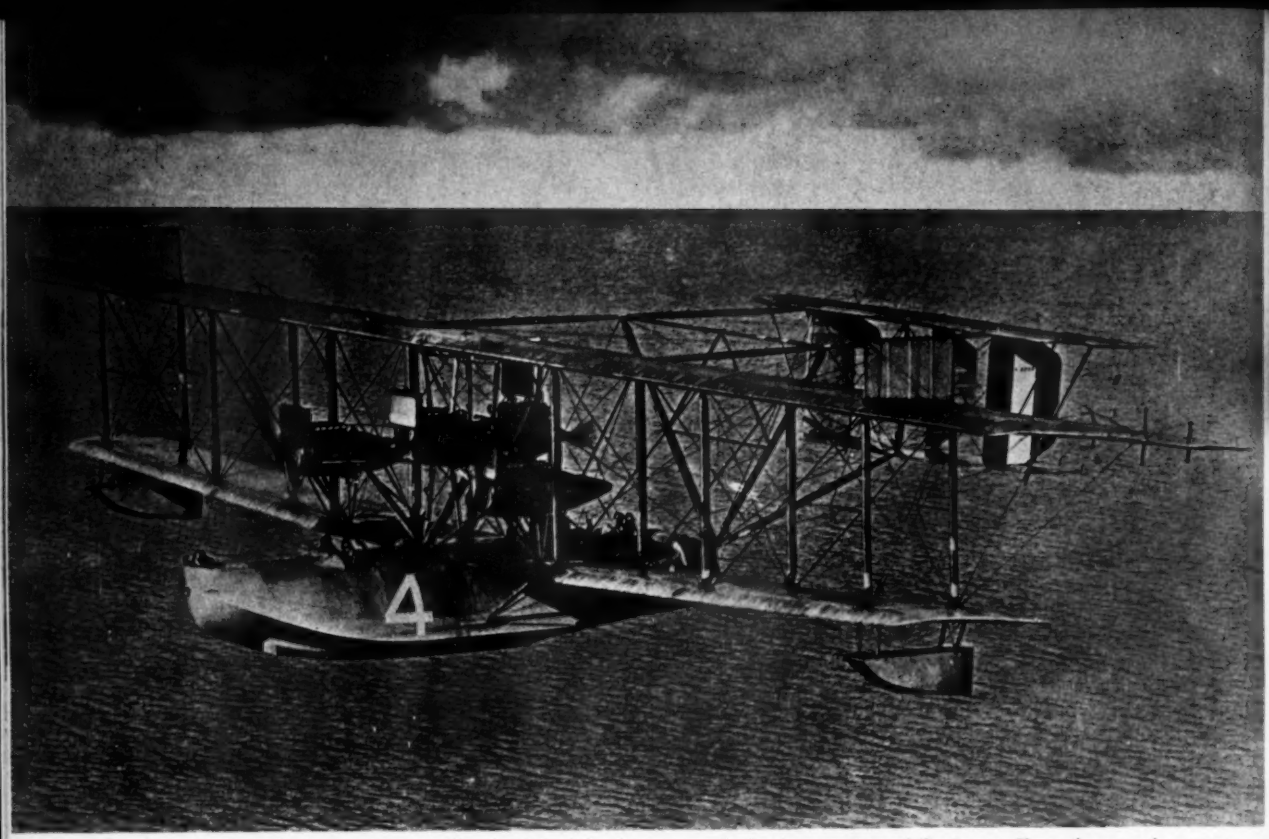
Babcock Models, Inc., in keeping with their policy of providing the RC fan with top quality circuitry, also passes on information to improve their present sets, when-

(*Continued on page 47*)





O.S. Max .35. One on right has exhaust-valve intake flap for control.



Her four wartime Liberties running steadily, the N.C. 4 heads out over the lonely ocean toward the Azores. Three planes made a mass attempt to span the Atlantic but the two sisterships were forced down. The N.C. 1 once carried 50 passengers on demonstration hop.

the First Transatlantic Flight

by ROBERT C. HARE

Even before the first World War the challenge of the Atlantic fascinated designers and pilots alike. This, the exciting story of the N.C. 4. First of two installments.

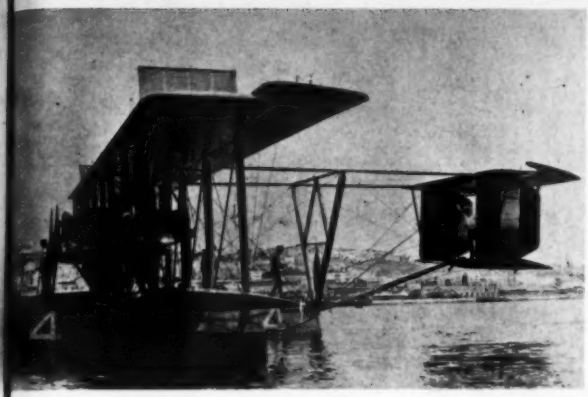
► In the early days of aviation, the challenge of flying the Atlantic Ocean was as great as the challenge of conquering the so-called "sonic barrier" a few years ago. The Atlantic fired the imagination of many a pioneer airman, like Walter Wellman, who, in 1910 took off from Atlantic City, N. J., for Ireland—and failure—in a powered lighter-than-air craft.

The advent of World War I put to a stop two projected transatlantic flights, either one or both of which might have been successful. In Germany, Helmuth Hirth, with financing of Count Graf Zeppelin of dirigible fame, had under construction a giant three-engined biplane in which he planned to fly to the San Francisco World's Fair, arriving in 1915. On this side of the mysterious Atlantic in 1914, Glenn L. Curtiss designed and built a medium sized flying boat, the America, for department store magnate Rodman Wanamaker. This craft was to have been flown to England by Lt. John C. Porte of the British Royal Navy.

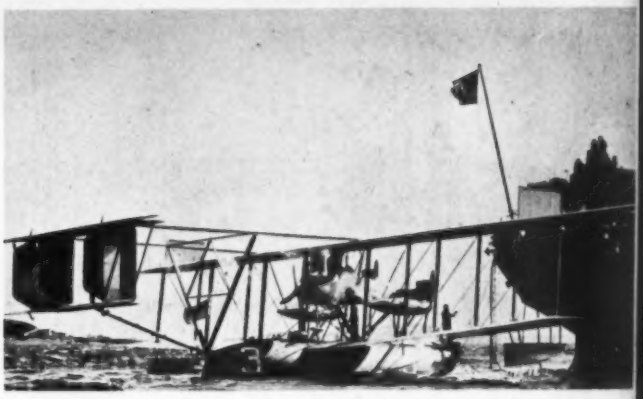
How practical these two attempts would have been had the plans been carried out, we'll never know. Out of World War 1, however, came several proven designs—mostly large bombers—that could have made such a flight had it not been for the United States Navy beating the competition to the punch in May, 1918, with the N.C. 4 (Navy-Curtiss) flying boat.

Interestingly enough, Curtiss' America flying boat was the root design for the highly successful Navy-Curtiss H-12, H-16, L-2 and HS-2L series as well as the N.C. 4 itself. Furthermore, Lt. Porte was so impressed by the America that he was instrumental in having it purchased by the Royal Navy for coastal patrol and anti-submarine duties. So promising was this type that it became, as well, the basis for the English F-series flying boats, design of which was spearheaded by Lt. Porte.

During World War I, the Navy did an extensive job of patrolling the Atlantic Coast looking for German submarines. Serious consideration also was given to supplying across-the-Atlantic cover for American troop transports. These factors led to the development of increasingly larger and longer range flying boats. With power loadings in-



For its time, the N.C. 4 was a giant. Note man standing in the biplane tail which, incidentally, spanned more than a DeHavilland 4.



The Curtiss Navy N.C. design was conceived during the war as long-range craft to protect shipping. Would carry guns, depth charges.

creasing in each design, it became evident that the "ultimate" flying boat—one that satisfied specifications met by the N.C. series—if built along conventional lines, never would have been able to get off the water.

Thus, when the Navy's call went out for a flying boat nearly twice the gross weight and one-third more air endurance than the Naval Aircraft Factory's 13,000 pound, 103-foot wingspan F. 5L, some serious hydrodynamic, aerodynamic and structural problems came into focus.

Glen Curtiss, together with Commanders G. C. Westervelt, J. C. Hunsaker and H. C. Richardson, of the Aircraft Division, Bureau of Construction and Repair, Navy Department, huddled over the drawing boards and came up with some radical designs.

Literally, they took the elements of an airplane, piece by piece, and when these elements were assembled the N. C. series was born. Since the hull was the key to success or failure for a 22,000 pound flying boat, that element was tackled first. Conventional World War I flying boats were characterized by wide hulls, the water resistance of which required long take-off runs. Acceleration was slow, but on the other hand they took off at a relatively slow speed, about 40 to 45 mph.

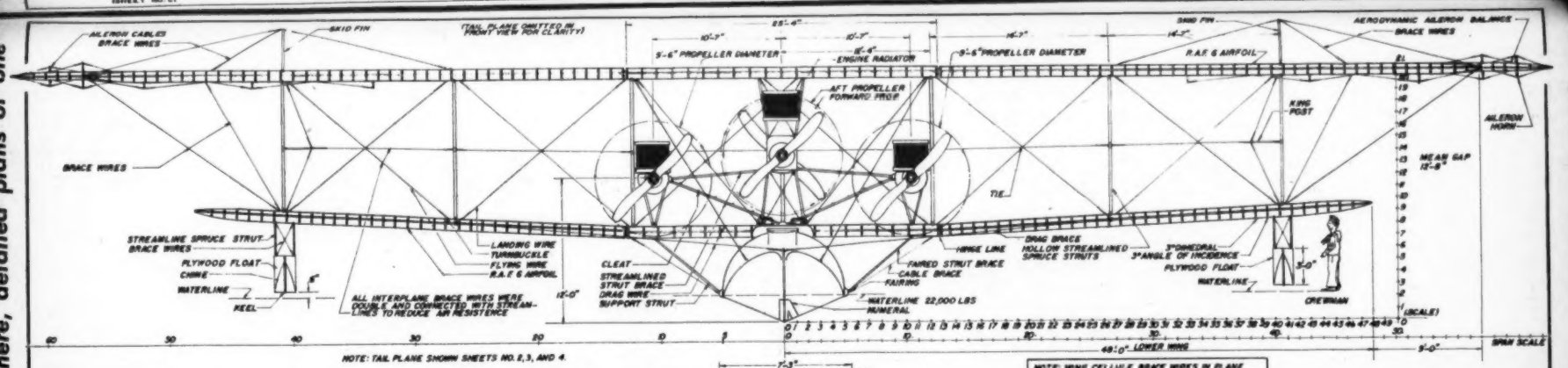
By careful design, the N. C. engineers developed a narrow hull of low resistance, which allowed the huge boats to accelerate rapidly to a take-off speed of about 65 mph, shortening the take-off run considerably. This resolved the problem of "porpoising" from one wave crest to the next which not only was uncomfortable for the crew, but frequently caused serious damage to the hull. The N. C. hull was so designed that it had a displacement of 28,000 pounds to a weight of only 2,800 pounds, an unheard of proportion in those days.

What to do then, with the tail assembly? On conventional flying boats the empennage was mounted on the upturned end of the hull. Outriggers were the solution. Three hollow spruce booms braced with steel cables carried the N. C. elevators and rudders high out of the water. This arrangement also permitted installation of a machine gun in the stern of the hull, with a free field of fire aft.

Wings of the N. C. boats were another radical departure from standard practice. Here the designers and engineers ran into the A3-2 law which, simply stated, dictates that as a geometrically similar wing is increased in size, its structural weight increases by a larger proportion. Thus, if the N. C. wings (*Continued on page* 44)

Triumphantly taxiing in Lisbon Harbor, the N.C. 4 completes epic flight. Lt. Cmdr. Read, remarked, ". . . ocean shrunk tremendously . . ."

NAVY CURTISS N.C. 4. Published for the first time anywhere, detailed plans of one



NOTE: TAIL PLANE SHOWN SHEETS NO. 2, 3, AND 4.

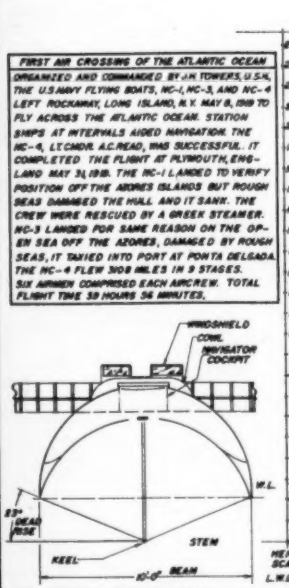
NOTE: WING CELLULE BRACE WIRES IN PLANE OF REAR WING SPAR OMITTED FOR CLARITY IN FRONT VIEW. THEY ARE IDENTICAL TO THOSE SHOWN IN FRONT VIEW.

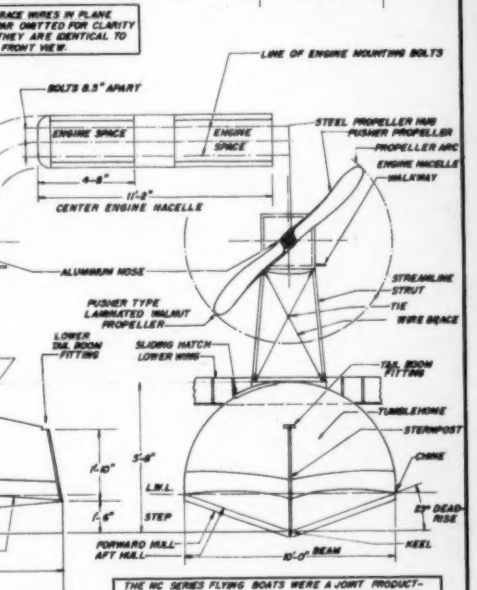
FIRST AIR CROSSING OF THE ATLANTIC OCEAN

ORGANIZED AND COMMANDED BY J.H. TOWERS, U.S.N., THE U.S.NAVY FLYING BOATS, NC-1, NC-3, AND NC-4 LEFT ROCKAWAY, LONG ISLAND, N.Y. MAY 8, 1919 TO FLY ACROSS THE ATLANTIC OCEAN. STATION SHIPS AT INTERVALS AIDED NAVIGATION. THE NC-4, LT.CMDR. A.C.READ, WAS SUCCESSFUL. IT COMPLETED THE FLIGHT AT PLYMOUTH, ENGLAND MAY 31, 1919. THE NC-1 LANDED TO VERIFY POSITION OFF THE AZORES ISLANDS BUT ROUGH SEAS DAMAGED THE HULL AND IT SANK. THE CREW WERE RESCUED BY A GREEK STEAMER. NC-3 LANDED FOR SAME REASON ON THE OPEN SEA OFF THE AZORES, DAMAGED BY ROUGH SEAS, IT TAXIED INTO PORT AT PONTA DELGADA. THE NC-4 FLEW 3108 MILES IN 9 STAGES. SIX AIRMEN COMPRISED EACH AIRCREW. TOTAL FLIGHT TIME 39 HOURS 54 MINUTES.

WING FLOAT SECTIONS A, B, C

THE HULL WAS DIVIDED INTO FIVE COMPARTMENTS BY FIVE TRANVERSE WATERTIGHT BULKHEADS ACCESS DOORS BETWEEN THEM. IN ORDER BOW TO STERN: NAVIGATOR'S, CONTROL BRIDGE, CREW'S QUARTERS, FUEL COMPARTMENT, RADIO AND FLIGHT ENGINEER.





ACKNOWLEDGEMENTS

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PETER BOWERS, AMERICAN AVIATION HISTORICAL SOCIETY.
PAUL EDWARD GARBER, NATIONAL AIR MUSEUM, WASHINGTON, D.C.
WILLIAM LARKINS, AMERICAN AVIATION HISTORICAL SOCIETY.
RAY SCHMITT,

THE MOUNTING, POSITION BETWEEN THE WINGS, AND NUMBER OF ENGINES USED IN THE NC-4 PROVED TO BE THE MOST SUCCESSFUL OF A NUMBER OF CONFIGURATIONS PREVIOUS INSTALLED. WHEN THESE AIRCRAFT WERE FIRST COMPLETED.

THE NC SERIES FLYING BOATS WERE A JOINT PRODUCTION OF THE NAVY AND THE CURTISS ENGINEERING CORPORATION, GARDEN CITY, LONG ISLAND, NEW YORK. THE NC-1 WAS TEST FLOWN OCTOBER, 1918 (3 ENGINES)

ENGINE POWER	4 @ 400 (4 LIBERTY 12 CYLINDER)
WEIGHT EMPTY	13,874 LBS.
USEFUL LOAD	12,126 LBS.
RANGE	1400 NAUTICAL MILES IN STILL AIR.
MAXIMUM SPEED	90 M.P.H.
CRUISING SPEED	77 M.P.H.
WING AREA	2380 SQ.FT.
WING LOADING	11.7 LBS. SQ.FT.
POWER LOADING	17.3 LBS. H.P.

NAVY-CURTISS NC-4

(SHEET NO.1)

(DRAWN BY WILLIS L. NYE FOR MODEL AIRPLANE NEWS)

of the great planes of American aeronautical history. Valuable, so save carefully!

THE HULL FOLLOWED TYPICAL MARINE CONSTRUCTION, BUILT AROUND A KEEL WITH TRANVERSE BULKHEADS AND FRAMES, LONGITUDINAL SPARS, SIDE KEELSONS, DORSAL AND VENTRAL STRINGERS, COMPRESSION STRUTS, CROWN PLATING, AND SIDE PLATING. ALL HULL MEMBERS WERE TREATED WITH WATERPROOF VARNISH.

SAME 130" BEAM

68'-2" (OVERALL)

ENGINE BEARER MOUNTING FLANGE

TOP VIEW

FRONT

SIDE VIEW

APPROXIMATE BLOCK DIMENSIONS LIBERTY ENGINE

NOTE: THESE DIMENSIONS WERE SCALED FROM PLANS OF THE HULL.

TUMBLEHOME

SECTION "A"

WATERLINE

SECTION "B"

DEGREE OF DEADRISE CONSTANT FOR FORWARD PART OF HULL.

LESSER ANGLE OF DEADRISE FOR AFT PART OF HULL.

THE CENTER OF GRAVITY AT MAXIMUM GROSS LOAD WAS LOCATED AT 34.4% OF THE M.A.C. THIS POSITION OCCURS AT 41" FROM THE LEADING EDGE OF THE LOWER WING.

THE NC-4 HULL AND ONE ENGINE ARE ON DISPLAY AT THE NATIONAL AIR MUSEUM, SMITHSONIAN INSTITUTION, WASHINGTON, D.C. THE WINGS AND TAIL STRUCTURE ARE IN STORAGE.

BRACE WIRE TO SKID FIN

FORWARD ENGINE RADIATOR

ELEVATOR CONTROL HORN

AFT ENGINE RADIATOR(CENTER ENGINE)

PITCH OF AFT PROPELLER GREATER THAN FORWARD PROPELLER

LIBERTY 400 H.P. ENGINE

BRACE WIRE TO UPPER WING

STEEL PROPELLER HUB

LIBERTY 400 H.P. OUTBOARD ENGINE(LEFT) OUTBOARD ENGINE RIGHT SIMILAR)

THRUST LINE OUTBOARD ENGINES

OIL TANK

DECK LINE

ALUMINUM COVERING WOOD FRAME NACELLE STREAMLINE STRUT

PLYWOOD CROWN PLATING

HATCH TO INTERIOR

PLYWOOD SIDE PLATING

NOSE

FREE BOARD

TOWING RING

DRAG WIRE

KEEL LINE CUTWATER

DRAUGHT

WHITE NUMERAL

PLANING BOTTOM

STRUT FAIRING WHITE NUMERAL

STEP

AFTERBOTTOM

KEEL LINE

STERNPOST

LOAD WATERLINE

WHITE NUMERAL

TAIL OUTRIGGER TRUSS WAS ORIGINALLY SINGLE WIRE BRACED. DOUBLE WIRE BRACING WAS A LATER MODIFICATION. LOWER STRUT WAS LATER BRACED WITH A KINGPOST TRUSS.

JOINT HOLLOW LINEN WRAPPED STRUT

UPPER HORIZONTAL STABILIZER FAIRLEAD

RUDDER HINGE LINE

ELEVATOR CONTROL HORN

ELEVATOR (UPPER)

HOLLOW STREAMLINE STRUT BRACE

CABLE BRACE

ELEVATOR CONTROL CABLE TURNBUCKLE

VERTICAL STABILIZER

CENTER BALANCED RUDDER

TIE

ELEVATOR LINKAGE CABLES

LINEN WRAPPING

HOLLOW STREAMLINE STRUT

TIE TURNBUCKLE

RUDDER CONTROL CABLE

OUTBOARD RUDDER

2° INCIDENCE

ELEVATOR CONTROL HORN

SINGLE HOLLOW STRUT LINEN WRAPPED 6" APART

LOWER HORIZONTAL STABILIZER

ELEVATOR CONTROL CABLE

ELEVATOR (LOWER)

OUTBOARD (2) VERTICAL TAIL SURFACES HAD BLUE, WHITE AND RED STRIPES MARKING

THE TAIL SURFACES HAVE A TOTAL SURFACE AREA IN EXCESS OF 300 SQ.FT. ALL MOVABLE CONTROL SURFACES ARE AERODYNAMICALLY BALANCED. THE CONTROL SYSTEM WAS THE CONVENTIONAL "DEP" SYSTEM. ALL FLIGHT CONTROL CABLES PASSED AROUND BALL BEARING PULLEYS.

THE DETAIL DESIGN OF THE "NC" FLYING BOATS WAS DONE BY BUREAU OF CONSTRUCTION AND REPAIR, U.S.NAVY, BY NAVAL CONSTRUCTORS HUNSACKER, RICHARDSON, AND WESTERVELT. ON NOV.8, 1918, THE NC-1 FLEW WITH 15 PASSENGERS FROM LONG ISLAND TO WASHINGTON D.C. AND THEN TO HAMPTON ROADS, VIRGINIA, A REMARKABLE FLIGHT AT THE TIME. A WORLD'S RECORD FOR PASSENGER CARRYING WAS ESTABLISHED ON NOVEMBER 27, 1918 WHEN 51 PASSENGERS WERE CARRIED IN FLIGHT. THE NC-1 WAS THE FIRST FLYING BOAT OF THE SERIES OF WHICH 9 WERE CONSTRUCTED. EACH FLYING BOAT DIFFERED IN CONSTRUCTION DETAILS AND ENGINE INSTALLATION. THE NC-1 WAS ORIGINALLY EQUIPPED WITH THREE LIBERTY LOW-COMPRESSION ENGINES OF 350 H.P. EACH. HOWEVER, A FOURTH ENGINE WAS INSTALLED FOR THE TRANSATLANTIC FLIGHT.

PLYWOOD PLANKING

2'-0"

9'-6"

WING TIP FLOAT PLAN

FLAT TOP DECK AND SIDES FITTING

THE NC-4 CARRIED 1810 GALLONS OF FUEL IN NINE ALUMINUM TANKS. THE ENGINE OIL TOTALED 142 GALLONS. THE FUEL WAS PUMPED TO AN AUXILIARY FUEL TANK BY ENGINE-DRIVEN FUEL PUMPS AND THEN FLOWED BY GRAVITY TO THE ENGINE CARBURETORS. THE FUEL TANKS WERE OF WELDED CONSTRUCTION AND WERE LOCATED IN THE HULL. THE GRAVITY TANK CAPACITY WAS IN GALLONS. WITH THIS FUEL LOAD THE RANGE IN STILL AIR WAS 1400 NAUTICAL MILES. THE ALUMINUM FUEL TANKS WEIGHED 70 LBS. EACH. FUEL COMPARTMENT WAS VENTED.

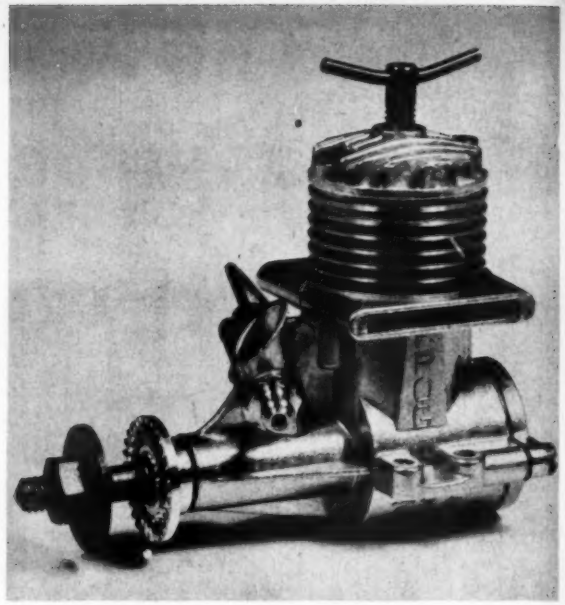
THE ENGINES WERE 12 CYLINDER WATERCOOLED VEE TYPE OF 400 H.P. EACH. THE CYLINDERS WERE 45° APART. CYLINDER BORE IS 5" AND THE STROKE 7". THE CUBIC DISPLACEMENT IS 1650". MAXIMUM ENGINE R.P.M. IS 1700. THE COMPRESSION RATIO IS 5.40 TO 1. THE B.M.E.P. IS 113. FUEL CONSUMPTION .54 LB. PER H.P. PER HOUR. OIL CONSUMPTION .03 PER H.P. PER HOUR. BATTERY TYPE ENGINE IGNITION AND DUAL CARBURETION. ENGINE LUBRICATION WAS PRESSURE TYPE DRY SUMP. FOR NAVAL PURPOSES THE LOW COMPRESSION ENGINE WAS NORMALLY SUPPLIED BUT THE NC TYPE FLYING BOATS ALL HAD 400 H.P. ENGINES INSTALLED FOR THE THE TRANSATLANTIC FLIGHT. VARIOUS ENGINE CONFIGURATIONS OF ENGINES WERE INSTALLED.

NAVY-CURTISS NC-4 (F VERSION)

SHEET NO. 21

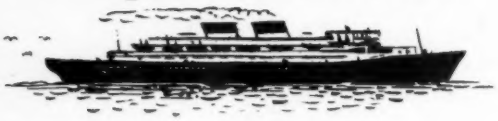
(DRAWN BY WILLIS L. NYE FOR MODEL AIRPLANE NEWS)

Fast Webra Piccolo-Glow from Germany superior to earlier Diesel version which could be tough to start. Follows U.S. glow practice.



Brand new low-priced Frog .049 Diesel also shows U.S. influence. Angled back needle valve assembly helps avoid skinned knuckles.

Import Review



by P. G. F. CHINN

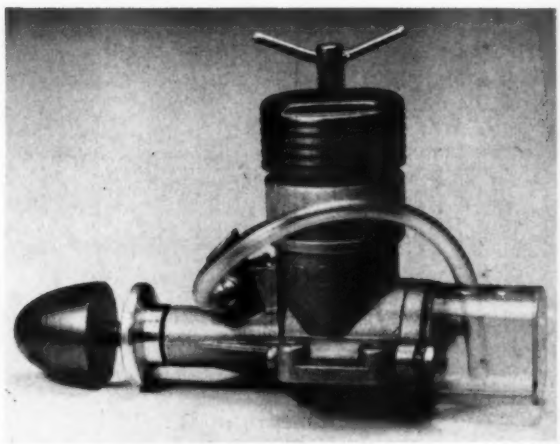
Production may be small, but foreign engine makers sure have their fun turning out new engines and modifying the old.

► This month's selection of imported motors is entirely European and comprises two Half-A's and two A Class motors, from three countries. They exhibit some markedly different features, but have one thing in common: each is the product of a company turning out large numbers (by foreign standards) of model engines. These companies include the largest model engine firms in Italy, Great Britain and Germany.

Super-Tigre G.31 .09 Diesel

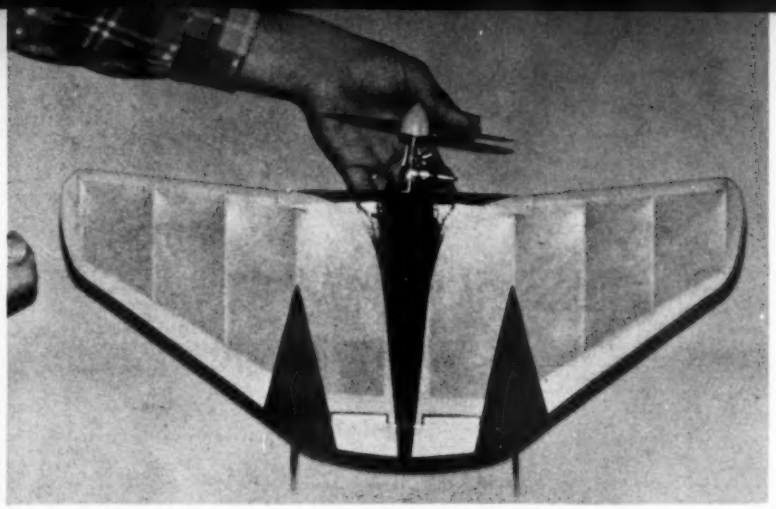
This, the latest model from the famous Bologna firm of Micromeccanica Saturno, is an .09 with a difference. It looks almost as though designer Garofali had taken his G.26 .09, sawn off the shaft and bearing in front of the intake and mounted a new shaft and ball bearing housing in place of the backplate.

Roughly, that is what the layout of the G.31 amounts to. The pressure cast crankcase embodies a 5/8 in. long plain bearing, in which the short, 7 mm. dia. (.276 in.) valve-shaft runs. An inclined downdraft intake of venturi section is integrally cast with the case and is provided with a reversible brass spraybar assembly. Gas passes through a 13/64 in. dia. admission port and a 13/64 in. dia. shaft passage. The rear end of the valve-shaft housing is machined on the outside to form a pressure ring, over which is fitted a synthetic (*Continued on page* 38)



Easy starting British Allbon Sabre diesel is an .09 of simple design and useful performance. Uses a synthetic "O Ring" as on McCoy.

Italian Super-Tigre G.31, .09 Diesel, a rare bird. Rear intake looks like normal front intake. Output 25-30% better than average.

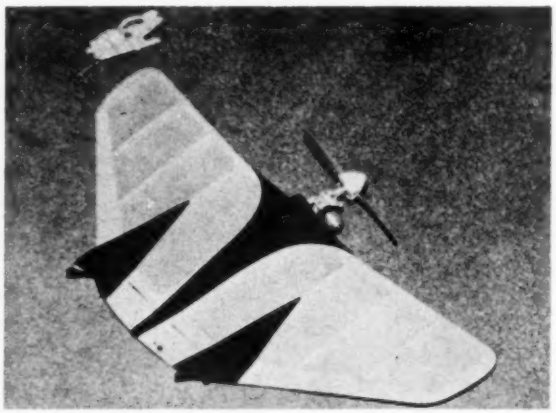


Eights and loops are done at blurring speed with Atwood Shriek .049 shown. Beginners should use a beat-up old engine, or run rich, to reduce speed. But ship gives second chance!

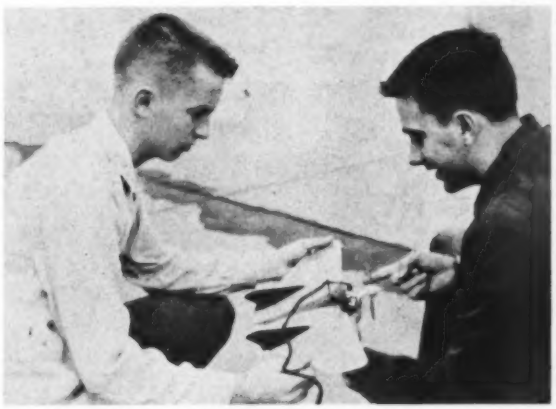
STREAK

by LARRY SCARINZI

This Half-A powered wing is a show stopper. On next two pages are full-size plans to make building a pleasure.



Swept-forward leading edge allows motor mounting against the wing without adding ballast. Balanced elevators seem important on wing.



"Junior Streak" Jimmy Bartlett, left, holds model while designer cranks engine. Sensitivity can be cut down by moving CG forward.

Perched on its master's hand, the docile bat shows twin tails. On 26-foot dacron lines, 6 x 3 prop, it's batty all right! You sharp?

► The model presented here is simple to build and capable of very high performance when powered by one of the modern hot Half-A engines. It is fast enough to keep any expert on his toes and will perform the full stunt pattern with ease. Using an Atwood Shriek my ship is capable of performing loops and eights at near blurring speed.

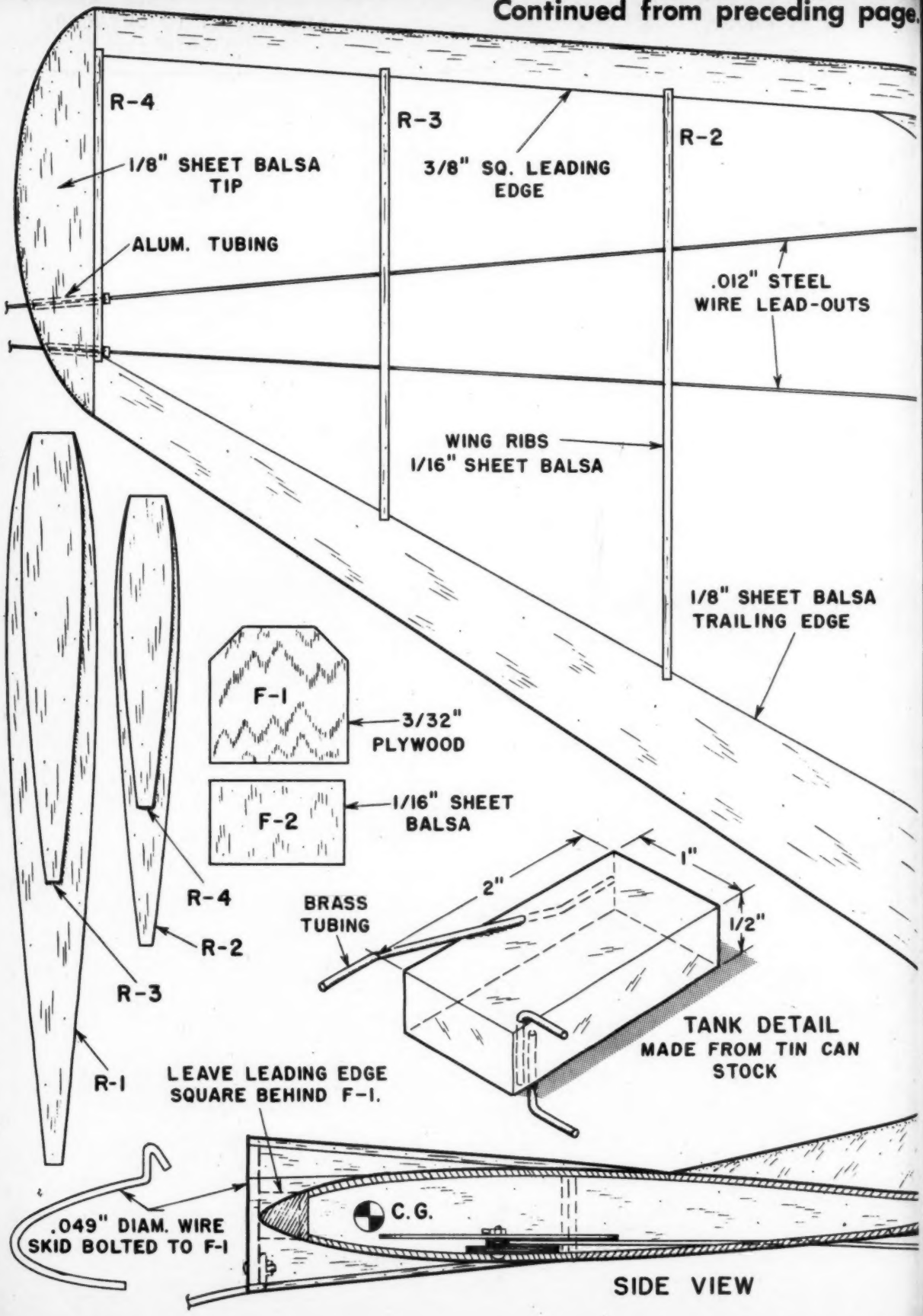
One look at the plans shown will sell many beginners on the simplicity of this design. A flying wing is not normally the best of designs for a beginner's first airplane. However, because it is quite rugged, he should get more than one try at successfully flying this model. For beginners, we advise using an older or less powerful Half-A engine and moving the CG foreward of where shown. These changes are easily accomplished and will greatly reduce the speed and sensitivity of this model, making it applicable to a beginner's needs.

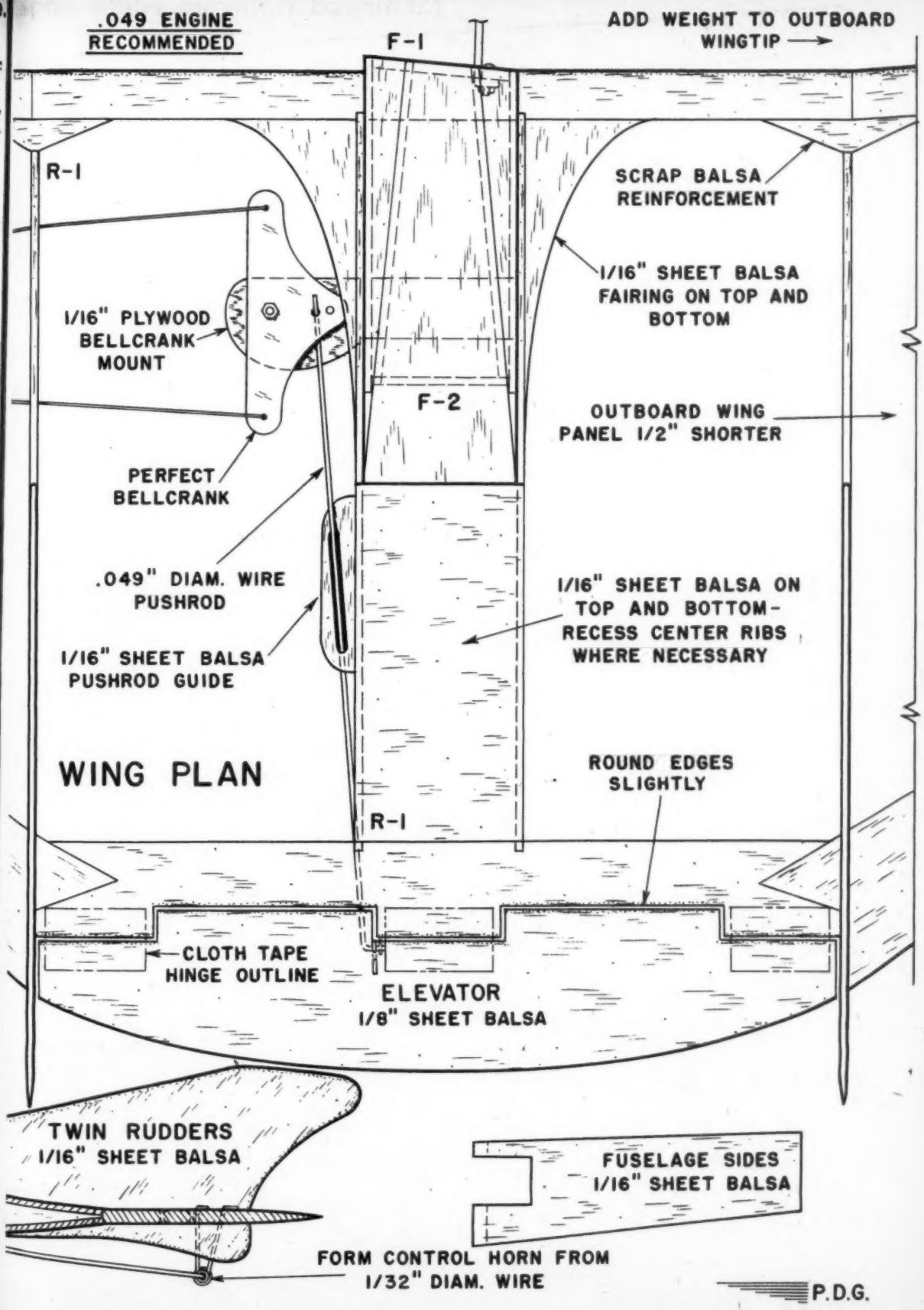
Presently, model builders have a broad choice of designs to pick from. Fortunately, there is no one ideal design for any of the specific purposes. If there was, variety would be killed.

The aerodynamic design of this model is the result of a lot of experimentation over past years. As with all our designs, performance was the first goal with simplicity and different appearance running close for second.

Several years back, our own (*Continued on page* 54)

Continued from preceding page.




.049 ENGINE RECOMMENDED
F-1
ADD WEIGHT TO OUTBOARD WINGTIP
R-1
SCRAP BALSA REINFORCEMENT
1/16" SHEET BALSA FAIRING ON TOP AND BOTTOM
1/16" PLYWOOD BELLCRANK MOUNT
F-2
OUTBOARD WING PANEL 1/2" SHORTER
PERFECT BELLCRANK
.049" DIAM. WIRE PUSHROD
1/16" SHEET BALSA ON TOP AND BOTTOM- RECESS CENTER RIBS WHERE NECESSARY
1/16" SHEET BALSA PUSHROD GUIDE
WING PLAN
ROUND EDGES SLIGHTLY
R-1
CLOTH TAPE HINGE OUTLINE
ELEVATOR
1/8" SHEET BALSA
TWIN RUDDERS
1/16" SHEET BALSA
FUSELAGE SIDES
1/16" SHEET BALSA
FORM CONTROL HORN FROM 1/32" DIAM. WIRE
P.D.G.

water, water, Everywhere!

Got no-place-to-fly blues? Not with a lake in sight, you shouldn't! Make yourself a flying boat, follow directions . . .

by A. G. LENNON

► Is that old flying field being covered with dwellings? Do you find the wide open spaces getting further and further away? Do you yearn for a wide level area where you can land anywhere around you? Then, try water RC flying.

You'd be surprised how many water areas there are scattered around that make ideal flying sites. When you are out in the middle you have the equivalent to a runway all around you and if you should goof, you don't pick up the pieces.

Most water areas, lakes, rivers, etc., of reasonable size have rowboats for rent somewhere on their shores. That's all you need. An outboard motor is a useful adjunct, but it is not at all necessary—you can fly your model back to, or near you. You get a big bonus from water flying—good clean fun in the out-of-doors, and after you fly you can cool off with a dip.

You'd be surprised the size of waves you can get your model to fly from. The writer has flown on lakes with waves 4 to 5 inches high. Of course, if the wind is blowing a gale you'd think twice, but you'd do the same thing in over-land flying.

There are a few important considerations apart from a soundly designed model. The first is to have your model well waterproofed. Silk or nylon covering is a must with at least six coats of dope to seal all the pores. Hatches for access to batteries, to escapement rubber, etc., should be sealed with sponge rubber with the coverings held firmly in place with rubber bands or screws. Those hatches that need to be opened infrequently can be further sealed with vaseline smeared on the mating surfaces. The same can be used for the escapement-rubber winding-wire bushing where it projects through the hull. Another seal is to run the wire through a small rubber block (soft eraser rubber will do) glued inside the hull.

Your switches will have to be contained inside the hull, with wire rods running outside, sealed as above. The phono-jack opening will also have to be sealed. The writer used the rubber eraser from a lead pencil for this purpose. It fits like a stopper in a bottle.

One of the most desirable features for enjoyable water rudder operated from or in conjunction with the air rudder. You'll find that in any wind at all, particularly with the planing tail hull design, your air rudder is almost useless. You just can't rely on it to bring your flying boat around into the wind. Any small wave which your wing tip floats strike can divert your model from its flight path, sometimes toward your boat or some other obstacle.

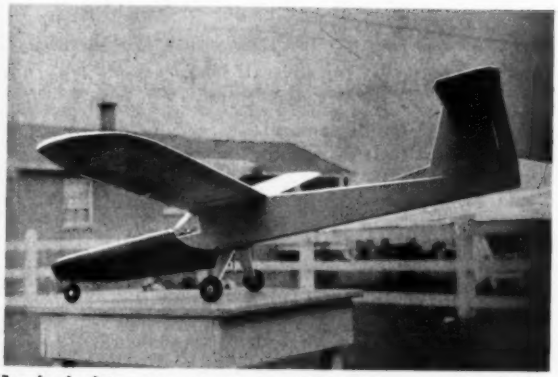
A water rudder gives you control of your course on the water. You can place your plane on the water, and if you have motor control, you can taxi out at low speed, turn into the wind, blip your motor into high speed and take off. On landing, with motor at low speed, you can direct your model back to your boat or to the wharf or beach from which you are operating. Here you realize one of the dividends that water flying has for you. You are not limited to a runway for landing, your landing strip is all around you and you can't miss.

There is nothing, but nothing, to equal the sight of a well designed model flying boat accelerating across the water to its take-off responsive to both water and air rudder, and few thrills to (*Continued on page* 43)

The now familiar NACA planing-tail hull insures excellent hops off water, reduces air drag. On sport fuel, runs to 150 feet.

A tried and true flying boat for engines of .15 to .23 displacement, this water bird will give spectacular take-offs and many a smooth flight.

FLAMINGO



For land duty, gear straps on. Take-offs are arrow straight. Wing tip floats detach for operations over nasty terra firma.

The structure is simple, though plans look tough—just because they are well detailed. With flippers, really flares out ROW.

by A. G. LENNON

►The Flamingo utilizes the planing-tail-hull formulae. It is of rugged design, and weighs 70 ozs., with a wing loading of 20 ozs. to the square foot. It has sustained one crash landing involving a chimney and a tree with minor damage.

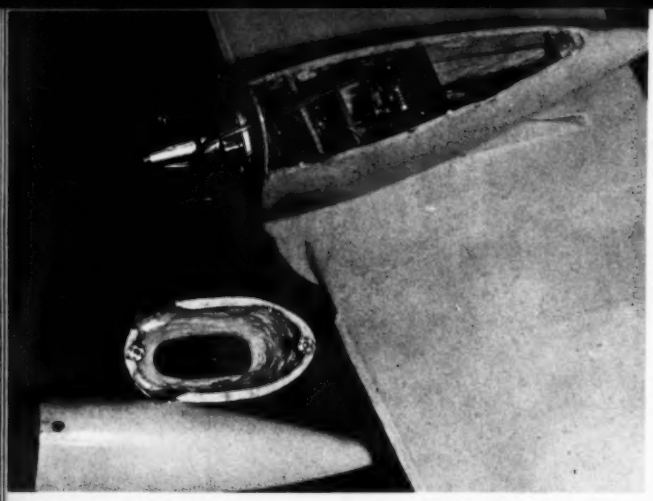
The original was powered with a .15 Torpedo and this is the minimum power recommended. A .19 or .23 motor can also be used. The nacelle as drawn will accommodate all 3 sizes, although with the .15 a ¼" thicker thrust adjustment block will be needed. Motors should be installed with adaptor plates for firewall mounting and beam mounting legs removed. Props recommended are 9" D 6" P for the .15 and 10" D 6" P for the .19. With the Babcock motor-control unit, high speed revs of 8500 RPM and low speed of 4000 RPM were obtained with the .15.

This model has beautiful flight characteristics. Turns are smooth, penetration is good and the climb with the .15 surprisingly good The design is clean for a flying boat, but the hull, nacelle and wing floats add plenty of drag so that the power-on, power-off transition is hardly noticeable. Water take-offs run to approximately 150 ft. without use of high-power fuel.

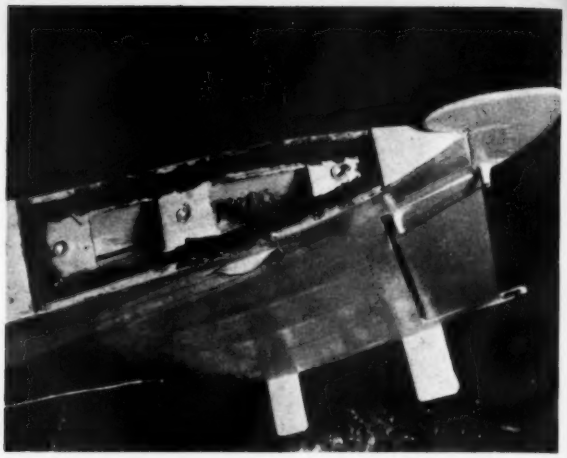
Radio and escapement equipment is all Babcock. Receiver is the BCR-3; the primary escapement the Babcock Mark II Super Compound, operating rudder and giving up-elevator. Flaring the water landings with up-elevator are a never to be forgotten thrill. The Babcock Universal Motor Control Escapement is used for motor control, high and low speed.

The original design of the Flamingo did not include a water rudder. However, when taxiing at low speed on the water, the air rudder is ineffective. A balanced water rudder, as shown, was installed and after several trial sizes had been tested, this one proved satisfactory. Its

Continued on next two pages



And here is K & B .15 inverted on a radial mount, tank, Babcock motor-control escapement, the rubber extending inside nacelle.



Balanced water rudder enables jazzy steering in H2O—it's a must. Black material is rubber sealing to prevent any leakage.

use is highly recommended if motor control is installed.

HULL: Cut out and assemble all bulkheads; ¼" sq. and rails. Do not omit block #21. Cut out front and rear portions of the hull sides and join. Add ¼" sq. and side rails to hull sides in the cabin area. Note doubler. Join sides in cabin area with ¼" square. Add bulkheads, top windshield former, windshield post and block #21 at stern. Plank bottom at rear, noting access hatches. Add step former L and draw in sides to lower bulkheads #4-5-6, add sternpost M to form pointed step.

Add keel and stringer of forebody. Plank forebody bottom. Install bonding to nose wheel tubing. Check installation of battery and radio chassis and install rear ply block. Install plywood escapement mounts and ⅛" ply for rear wing rubber hook mount and sloping bulkhead 8A.

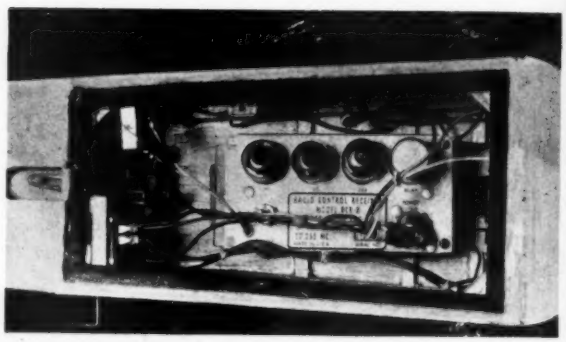
Install escapement, control rods, rear rubber hook, elevator pull rod, rudder linkage and ¼" escapement rubber motor. Bond all metal parts as shown. Install afterbody top deck planking and access hatches. Add noseblock to bulkhead #1 and carve to shape.

FIN & RUDDER: Assemble fin and rudder. Make sure push rod holes in rudder ribs are on the correct side of rudder. Check alignment of top and bottom ribs carefully since they establish angular relationship of tailplane. Install fin on fuselage and add rudder. Install water rudder at this point.

WINGS: Construction is straightforward. Note that dihedral break is not parallel fore and aft. Assemble center section and then add outer panels at correct dihedral. Wing-float mount ribs can be assembled as a sub assembly to be installed during wing construction. Wing panels should be assembled on an absolutely flat surface to insure accurate alignment for true flight.

TAILPLANE & ELEVATORS: Straightforward. Note hinges on top surface only. Since leading edge of elevators butts against trailing edge of stabilizer, no down travel stop is necessary. Note the ply saddles on the fin and the locating dowels which plug into openings in the 1/32" sheet stabilizer covering. These are essential to keep the elevator properly located to avoid any fouling of the elevator control linkage which could render all controls inoperative.

NACELLE & COWL: These are shaped from solid blocks hollowed out. Bottom of the nacelle is slotted to take the nacelle strut which butts against the nacelle floor. The strut also engages in a slot in the rear firewall plywood. Lower end of the strut plugs in between the two center ribs of the wing. In assembly check all alignments. Cowl and nacelle top cover rear are held in place with large



RC experts might hide the wires but this, author's first radio attempt, was howling success. Babcock receiver fits real snug.

dress snaps. Front of the nacelle cover is held with a simple wire clip attached to motor hold-down bolt and balsa lugs prevent sideways shifting of the top.

Gill vents in the cowl are cut and shaped from any thin soft aluminum and cemented to the cowl. Balsa behind the cowl is cut away (see detail photo) to permit free exit of cooling air.

Note the soft brass wire to glow plug and one motor mount bolt projecting from side of firewall. The author uses two alligator clips taped to a small block of wood, one above and one below. Block is ¼"x⅜"x1⅜". Alligator jaw levers are opposed so that both clips may be opened at once by pressing with forefinger and thumb. This makes a firm contact between battery leads and glow-plug wires that is simple to engage and remove.

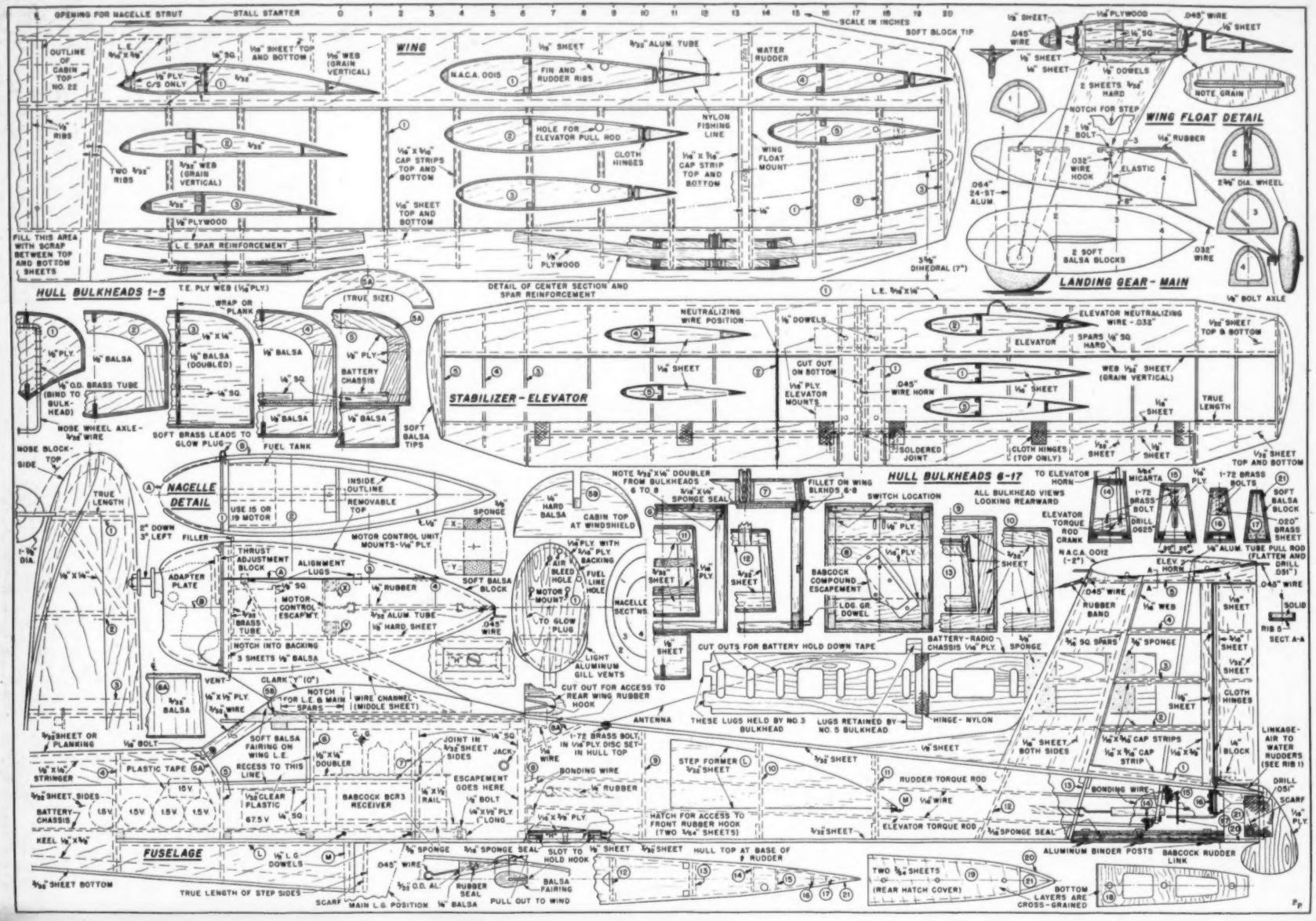
Note wire channel in the middle lamination of the nacelle strut. This permits leading motor control escapement and bonding wires into the hull beneath the wing. (See Radio & Escapement Installation).

WING TIP FLOATS: Shape and hollow from soft balsa blocks. Install struts and top fairing and dowels which plug into openings in wing underside. Top of float strut and fairing may be silk reinforced for added strength.

COVERING: The author used silk, with 6 coats of Testor's butyrate dope. Black and orange-yellow were colors, the latter for visibility.

SEALS: Do not overlook seals beneath the wing and at the access hatches and points where the switch and rubber hook wires project. Seal the phono-jack opening with a pencil eraser. Oil the control rods and linkage before installation to avoid rust. Use 3M Rubber Cement to bond sponge in place for mounting receiver etc. and rubber to top of main landing gear. (*Continued on page* 47)

FULL SIZE PLANS AVAILABLE. SEE PAGE 56.



1957 NATIONAL WINNERS!

Held July 29 through August 4, at Willow Grove Naval Air Station, Pa., the 26th Nats had biggest turnout in history.

WHO WON?

Grand National Champ	James G. Paysen, 570 pts.
Open National Champ	James G. Paysen, 570 pts.
Sr. National Champ	Donald Gurnett, 360 pts.
Jr. National Champ	Hardy G. Lewis, Jr., 280 pts.
Club Team Champ	Brain Busters

INDOOR

Stick: Open—Joe Bilgri, 32:53.8; Sr.—Raymond B. Harlan, 22:40.2; Jr.—Stephen Stackhouse, 12:10.
Paper Stick: Open—Stanley Shute, 19:34.0; Sr.—Raymond B. Harlan, 19:48. ; Jr.—Brent Hawkins, 10:12.6.
Cabin: Open—James B. Grant, 20:26.0; Sr.—Raymond B. Harlan, 12:18.5; Jr.—Larry Willis, 6:20.5.
Hand-Launched Glider: Open—William Dunwoody, 1:04.6; Sr.—Lee Hines, 1:17.2; Jr.—W. Wigglesworth, 0:52.8.

GLIDER

Hand-Launched Glider: Open—Bob Bienenstein, 11:42.2; Sr.—R. F. Tanner, 12:41.1; Jr.—Michael Scuro, 6:12.3.
Nordic A-1: Open—Merl Shammo 13:12.4; Sr.—Stanley Watson, 10:36.7; Jr.—Joseph Scuro, Jr., 8:47.2.
Nordic A-2: Open—William H. Parmenter, 14:54.0; Sr.—Donald Gurnett, 12:39.4; Jr.—Weldon D. Cargin, 9:16.5.

RUBBER

Wakefield: Open—Don MacKenzie, 17:54.2; Sr.—Gerald Elliott, 15:00.0; Jr.—Larry Willis, 11:23.3.
Unlimited: Open—Robert L. Hatschek, 13:13.0; Sr.—John F. Watson, 11:05.5; Jr.—Dan O'Malley, 12:42.0.

FREE FLIGHT

Half-A: Open—James McGee, 20:25.2; Sr.—Rudy Kluiber, 22:15.0; Jr.—Steve Hale, 12:18.2.
Class A: Open—Don Assel, 30:05.2; Sr.—Rudy Kluiber, 30:07.5; Jr.—Suzanna Allen, 13:43.9.
Class B-C: Open—Charley E. Diller, 24:30.3; Sr.—Jack Moreland, 28:35.2; Jr.—Alan Whitman, 11:36.4.
ROW: Open—Robert Kleinfelder, 12:00.0; Sr.—Robert Nichols, 9:34.1; Jr.—Larry Willis, 8:14.3.
FAI Power: Open—Daniel Sobala, 22:08.5; Sr.—Donald Gurnett, 21:48.1; Jr.—Gary Feekes, 17:33.3.
Flying Scale: Open—Dan Lutz, 156.0 pts.; Sr. and Jr.—Mike Levin, 91.4 pts.
Helicopter: Open, Sr. and Jr.—Parnell Schoenky, 174.12 pts.
Rocket Power: Open—John Allen, 11:08.0; Sr.—Rudy Kluiber, 9:28.1; Jr.—Dan O'Malley, 5:15.4.

PAA LOAD

American Class: Open—Clifford M. Montplaisir, 15:01.8; Sr. and Jr.—Harold Thompson, 10:38.7.
International: Open—Robert Sutton, 11:00.0; Sr. and Jr.—Phil Grau, 10:56.0.
Clipper Cargo: Open, Sr. and Jr.—Donald Gurnett, 100¼.
Jet: Open—Fred Pearce, 6:44.8; Sr. and Jr.—Robert Guthi, 3:16.5.
Junior Jet: Brent Hawkins, 3:06.1.

CONTROLLINE

Speed Half-A: Open—Warren V. Kurth, 100.52; Sr.—Alan Brooks, 87.35; Jr.—Hardy G. Lewis, Jr., 90.60.
Speed A: Open—Bill Wisniewski, 154.58; Sr.—James Landry, 126.00; Jr.—Hardy G. Lewis, Jr., 134.88.
Speed B: Open—Arnold Nelson, 153.00; Sr.—John Wells, 144.06; Jr.—Hardy G. Lewis, Jr., 142.46.
Speed C: Open—B. Randall Cullin, 169.58; Sr.—John Wells, 157.42; Jr.—Hardy G. Lewis, Jr., 147.72.
Proto Speed: Open—Alfred Stegens, 119.67; Sr.—Jere Draper, 117.18; Jr.—Hardy G. Lewis, Jr., 102.19.
Jet: Open—Ted Reese, 177.27; Sr. and Jr.—George Blass, 143.37.
Stunt: Open—George M. Aldrich, 618.0; Sr.—Arthur Pawloski, 605.5; Jr.—Bob Winks, 588.0.
Flying Scale: Open—Tom Dean, 347.2; Sr.—Michael Burke, 237.4; Jr.—Jerry Ferguson, 197.2.
Combat: Open—Joseph W. Kastetter; Sr.—Arthur Pawloski; Jr.—Robert Krakauskas.
Team Racing: Robert Heminway, 8:27.5.
U. S. Navy Carrier: Open—C. Stephen Babin, 520 pts.; Sr.—Robert Heminway, 499 pts.; Jr.—Bob Himmelman, 375 pts.

RADIO CONTROL

Multi-Channel: Bob Dunham, 266.5 pts.
Rudder-Only: Open—Richard C. Allen, 106.5 pts.; Sr. and Jr.—Dick Bennett, 80.5 pts.
Intermediate: Donald H. Brown, 139.0.
Scale: George D. Kilboy, Jr., 102.5.
Pylon Race: Keith H. Storey, 24.3.

FOREIGN NOTES

by P. G. F. CHINN

Italy

► Promise of a strong challenge to the Czechs at the forthcoming World Speed Championships in Czechoslovakia seemed indicated by performances at the Italian Coppa Supertigre speed and team race meet held at Bologna, June 8-9. Top Italian speed men Prati, Berselli, Cappi and Cellini, all exceeded 120 mph.

First and most important Italian speed event of the year, the Coppa Supertigre contest was held in the main square of the Giardini Margherita park and was organized by the model section of the Bologna Aero Club. Flying circles, of which there were two, were surrounded by 15-ft. wire net safety fences and seating accommodation was provided for about two thousand spectators. There was a public address system and two massive score-boards, plus an ingenious team-race indicator, erected on scaffolding. It seems to be generally agreed that the organization was first rate and satisfied contestants and spectators alike.

Three types of motors dominated the meet: the latest works-version of the well-proven Super-Tigre G.20, the Barbini B.40TN which performed so well in last year's World Championship and the brand-new Super-Tigre G.30 Diesel which, by its outstanding performance in the team race, seemed to bear out our earlier suggestion in this column that the all-conquering British Oliver may at last have found a worthy rival.

Weather was fairly hot and even faster times were achieved in practice than in the actual contest. Nevertheless, Amato Prati of Bologna, former World Record holder, turned in an official flight of exactly 200 km./hr., or 124.3 mph, while Paulo Berselli, also of Bologna, returned 196.72 km./hr. (122.2 mph). Both Prati and Berselli were using factory prepared G.20's. Close behind, flying Barbini B.40 powered ships, were Clemente Cappi of Milan and Giovanni Cellini of Treviso with 121.4 and 120.9 mph, respectively. In fifth place was Renzo Grandesso of Venice with 117.1 mph.

Prati's speed during the first seven laps is believed to have been a good deal higher than his qualifying 124 mph as the motor lost revs during the last three laps, due, it is believed to inadequate cooling. We have since heard that Prati has flown at 212 km./hr., or some 131.7 mph. Remember, these motors are only 15's.

After the speed events, the team race was flown off and resulted in a win for Flaviano Fermi (pilot) and Carletto Bergamaschi (mechanic) from Milan. Their .15 cu. in. Super-Tigre G.30 powered ship, with 8 x 8 Tornado prop, was clocked at 140 km./hr. (87 mph) and had a consumption of 38/42 laps per tank.

The meet closed with stunt and combat demonstrations and with much applause for Berselli and Larcher with their spectacular jet-powered stunters.

British Nationals

This year's British Nationals, held, once again, on the RAF airfield at Waterbeach, near Cambridge, were marred by bad weather. Wind, followed by heavy rain, spoiled a well-attended two-day meet which featured 1250 entries from 750 modelers representing 128 clubs from the length and breadth of Great Britain.

Held the same week-end as the above-

(*Continued on page* 60)

What do you look for in a model airplane fuel?

Whether you do stunt, contest, or just-for-fun flying, you probably are most interested in the very best possible all-around performance that a fuel can give to your engine. And that's exactly the reason why more and more modelers — novices and veteran flyers alike — prefer Testor's "39," the outstanding all-purpose fuel for all standard model glo engines! See for yourself on any basis of comparison you choose. Check it for easy starting . . . all-weather performance . . . power output . . . quality and quantity of lubrication. You'll agree that Testor's "39" makes flying more fun . . . gives you the dependable operation you want under every flight condition. It's a safe fuel, too . . . formulated to protect your engine and insure you more hours of enjoyable, satisfying flying time. Records? Testor's "39" holds them in both speed and endurance classifications! Get "39" now. You'll find the familiar red, yellow, and blue cans at dealers everywhere . . .

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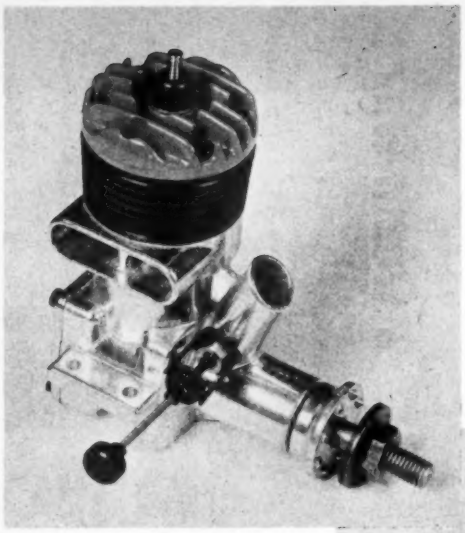
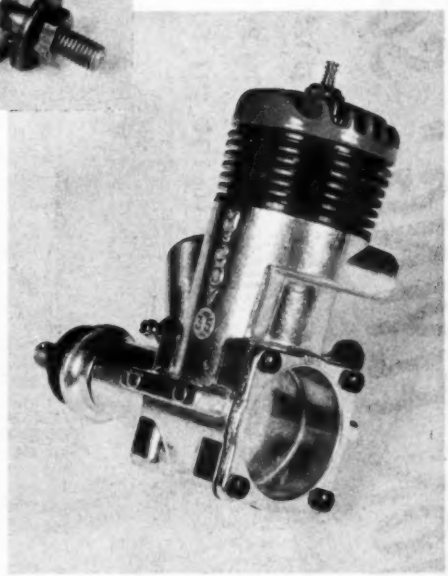


Engine Review

by E. C. MARTIN

Problem: How to keep performance comparable to older Redheads, at ten bucks?

McCoy .35 Redhead



► Hitherto, a new Redhead has followed the proven formula evolved by Dick McCoy some 15 years ago, of alloy block, drop-in liner, alloy piston with two rings, double ball-bearing crankshaft and rotary-disc induction. A complete departure from such a successful design is therefore not to be passed over lightly. New Macs we have seen in plenty in the popular price bracket but not with a red roof.

To be worth all the trouble of producing it a new engine has to suit the current market and also have something extra to give it an edge. This is the era of the good ten dollar engine. The old Redheads belong to a more fancy era, and perhaps, for those who could afford it, a better era. However, when the trend says ten bucks the manufacturer also says it and makes the best he can. If he does not, his name eventually becomes, like so many first class names, a pleasant memory. The new Mac, therefore, fits in with the trend and provides a very good ten dollar engine, and the fact that its performance is typically Redhead, but without all the expensive machinery, is a real tribute to the ability behind it.

It is curious how the old things come back to replace the new. Opposed porting after a period of obsolescence is back again full blast. Shaft rotary, after complete eclipse by the disc valve, is now what every well dressed engine is wearing, and lapped pistons which were once treated with amused contempt in speed circles, are back at higher knottage than ever.

We have several logical excuses for this about face, and the most logical of all, the one which ties up all the foregoing, is simply money. Outside of that we feel that the past has shown that, if money were no object, the ultimate in racing engines would have opposed porting, chromed low expansion alloy piston, leaded liner, disc or reed valve and ball-bearing crank. Take the expense out of that and you come to something very like the McCoy .35.

Naturally, we immediately checked with the McCoy section of our engine cupboard to see how the new parts swapped around with earlier models and found that nothing obvious in the souping line is possible. In other words the .35 has a new set of dimensions all through.

In recent tests we have discussed the apparent virtues of cooling fins integral with the cylinder liner, and the reduction of bore distorton achieved by carrying the head retaining screws down by tappings in the port belt. Many of the best engines have shown significant improvements from this feature. The adoption of ports with radiussed rather than square extremities has permitted larger port areas without serious piston (*Continued on page* 40)

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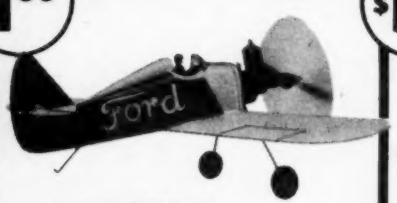

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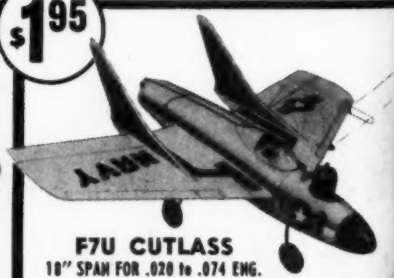

F7U CUTLASS
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Import Review

(*Continued from page 22*)

rubber oil seal. The valve-shaft itself, of hardened alloy steel, terminates in a disc at the front end, slotted to receive the pin drive from the crankshaft.

The crankshaft proper is of hardened and heat treated nickel-chrome steel and is provided with a machined-in crescent counterbalance. It is carried in one 7 x 19 mm. inner, and one 5 x 16 mm. outer, ball journal bearings of German manufacture. These are rigidly housed in a diecast housing, heavily flanged and secured to four tapped lugs on the squared front end of the crankcase. A paper gasket is used to seal the joint. Drive to the prop is conveyed by means of a tapered split collet, over which is fitted a ¾-in. dia. driving hub protecting the front ball bearing. A washer and a spinner-nut complete the assembly.

Cylinder design follows that successfully used on other Super-Tigre A Class Diesels produced during the past three or four years. This consists of a one-piece unit with machined fins and ports, blued on all non-working surfaces and screwed into the top of the crankcase. On the G.31, the material used is a hardened lead-iron. Porting is of the reversed-flow scavenged type, with twin opposed exhausts and twin internal bypass flutes which are properly radiussed at the top.

The piston is of Meehanite, with a dural yoke for the wristpin bosses, secured by a snap ring inside the piston skirt. A machined dural connecting rod is employed. The fit and alinement of the wristpin and crankpin bearings on our test sample were beyond criticism. The piston has a bevelled crown, to which the contra-piston is matched. Four screws are used to attach the alloy cylinder-head, which is topped by a substantial compression screw.

Breaking away from the ultra-short stroke layout of the previous G.26 front rotary model, the new G.31 has a stroke/bore ratio of .96, dimensions being 12.5 x 12 mm. (.492 x .472 in.) and giving a displacement of 1.473 c.c or .0899 cu. in. For this displacement the motor is not light, weighing a fraction under 4 oz., but this is tolerable, having regard to the high output, which is 25-30% better than most .09 Diesels.

On test, we found that the G.31 handled well and started easily. The needle-valve position at the back made for safe and comfortable adjustment and the contra piston moved smoothly, with no tendency to seize when hot.

This is essentially a high-speed diesel and really comes to life at the higher revs. Following a three-hour break-in, we obtained an output of .16 bhp at some 16,000 rpm, which, of course, is excellent. During tests the G.31 was run up to a maximum speed of 18,000 rpm. Like all Super-Tigres, the G.31 is a quality product and well able to stand up to continuous high-duty operation.

Frog 80 .049 Diesel

An entirely new Frog engine for 1957 is the Model 80 Diesel. This has a displacement of .0493 cu. in. (.807 c.c.), derived from a bore and stroke of .400 x .392 in., and weighs 4 oz. Aimed at the popular market, it is modestly priced, well built, of nice appearance and, on our findings, much easier to handle than the previous small Frog model, the .03 cu. in. Frog 50, that it replaces.

The most significant departure from normal practice with this new Frog engine is the makers' adoption of a synthetic rubber O-ring on the contra-piston, a feature hitherto confined to the American McCoy and Cub Diesels and, for the past four years, stubbornly rejected by Europe, the home of the Diesel. Another small but useful refinement of American origin is the non-metallic thread insert (in this case of nylon) which prevents the compression screw from working back.

Looking deeper, one can detect further American influence in production techniques: the high-quality tumbled die-castings, which reduce machining operations to a bare minimum, and the splined crankshaft end with its forced-on dural prop driver.

The cylinder of the 80 has integral turned fins and uses 90 degree exhaust ports on each side, with 90-degree intake ports fore and aft below them. A 360-degree bypass passage is employed. The cylinder is topped by a deeply finned diecast head and two through-bolts tie the entire assembly to the crankcase. The piston is flat-topped with a full floating wristpin and forged dural rod.

On test, this new Frog behaved quite impeccably. Starting should be very easy for everyone except those totally unfamiliar with Diesels. Running qualities were exceptional among Diesels for smoothness and consistency. Another notable feature was the 80's fuel economy.

The 80 is not the most powerful motor of its size ever built, but the output obtained on test of .064 bhp at a shade under 12,000 rpm is comparable with most Half-A's and, on the larger prop sizes (7 x 3, 7 x 4) it shows a marked improvement on the average glow motor of equivalent displacement, though at the cost of slight extra weight.

Webra Piccolo-Glo .049

Three years ago the Berlin firm of Bragenitz & Co., makers of the noted Webra motors, introduced a Half-A Diesel called the Piccolo. Although intended primarily as a beginner's engine, the Piccolo turned out to be more than a trifle temperamental, having some unpredictable and often vicious starting (or non-starting) tendencies, which inevitably developed into furious attacks of the shakes, calculated to vibrate your model to pieces, if you were insistent on the Piccolo doing some work.

The more recent arrival of the Piccolo-Glo was a far happier event. This new and entirely redesigned glowplug version eliminates all the faults of the Diesel model and, in general, follows typical American Half-A practice.

A beam mount crankcase with screw-in cylinder liner having three radial exhaust and three inclined circular bypass ports, is employed. This is topped by a machined alloy finned cooling barrel and head, fitted with one of the new Webra glowplugs. The cast-iron piston has a flat crown with a pressed in wristpin and a short, rigid, diecast rod.

Performance-wise, the Piccolo-Glo has the usual moderate maximum torque figures of the typical glowplug Half-A, relying on a high peaking speed for a useful horsepower output—only more so. Our test engine was surprising here, the torque figures declining so slowly as to allow the power curve to climb to a peak of approximately 18,000 rpm, where an output of .059 bhp was obtained.

The Piccolo-Glo retains the short stroke of its predecessor (10.5 x 9 mm.—.413 x .354 in.), giving a swept volume of .799 c.c or .0475 cu. in. The motor is compact and well proportioned and scales 1.35 oz.

Allbon Sabre .09 Diesel

The Allbon Sabre, built by Davies-Charlton Ltd., is the successor to the Allbon Javelin, which was one of the most popular .09 Diesels ever built and remained in production for nearly six years. The new engine retains the Javelin's low stroke/bore ratio of .8 (.525 x .420 = .0909 cu. in.)

(*Continued on page 40*)

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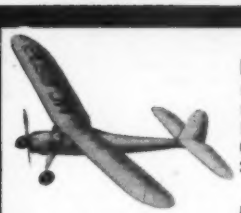

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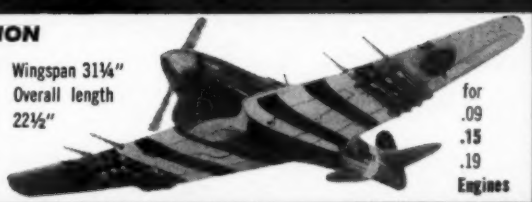
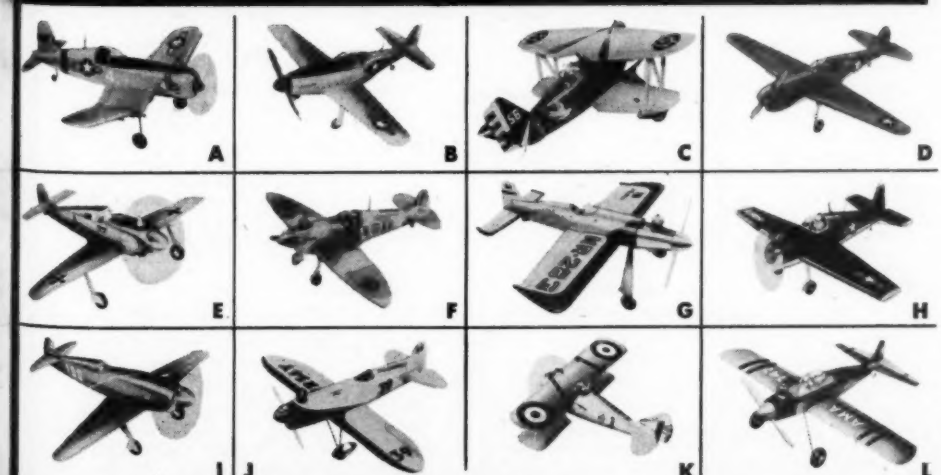


for .09 .15 .19 Engines



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but has been entirely redesigned structurally in the light of modern quantity production requirements. The engine is well made and well finished and is intended for hard general purpose use rather than for any specialized contest applications.

The Sabre is assembled around a matt finished pressure cast crankcase and main bearing unit which surrounds the liner well past the exhaust port level. At this point the crankcase is widened to accommodate the lower section of the finned cooling barrel, which screws into the crankcase, clamping the cylinder liner at the exhaust flange. The liner is of hardened nickel-chrome steel. The piston, which forsakes lightness for heavy wristpin bosses and improved crankcase compression, is almost 'solid' and is of alloy steel. It has a flat crown and a full floating wristpin. The conrod is forged from high duty RR.56 alloy.

The crankshaft, which is of nickel-chrome steel, has a disc web and a 9/32 in. diameter journal. The bearing is 1 in. long, the shaft running direct in the case material. There is a 15-degree taper on the front end of the shaft to which the driving hub is mated. Prop drive assembly is completed with a solid spinner-nut. Both this latter and the cylinder barrel are color-anodized red.

The crankcase carries substantial beam mounting lugs, but can also be radially mounted by means of the backplate screws. Alternatively, the screws serve to attach a 30-second transparent fuel tank to the engine. The needle-valve assembly, of brass, is raked back 15 degrees and is therefore non-reversible.

On test the Sabre delivered its best performance at between 13,500 and 14,000 rpm, where the output was .12 bph. The engine was tested at speeds from 5,000 to 15,000 rph under load. It was easy to start on all sizes of props and ran smoothly and evenly.

Engine Review

(*Continued from page* 34)

scuffing, and performance has improved accordingly. Rotary valve ports have grown in company with bigger shafts, and large intake bores have become more practical with the use of longer intakes.

Bearing friction has been reduced by improved lubrication at high speeds from the use of porous sintered materials. Lapped piston weight has been minimized without loss of strength by sintered iron moldings, and heavy-load performance and hot starting have improved without great sacrifice at the top end. Port timing, fuels and plugs have all been re-examined, and bypass areas and crankcase volumes taken seriously. All these refinements have leaked into modern engines to make up for the disappearance of costly mechanical features, and, in completely redesigning the McCoy, every one has been incorporated. That is why this new ten dollar Redhead is well up to the standard of its illustrious ancestors but with the added virtue of not having their faults. Where does it fit into the present scheme of things? We would take it very seriously in choosing a power unit for a six-foot multi-channel radio stunt plane. Steady power at all loads, unworried by temperature variation, and apparently immune to over revving on lean mixture, it should give long trouble free service even when worn to the state when it rattles. Add to this a substantial casting and mounting lugs, a strong crankshaft, and a long intake that lends itself to most any kind of speed-control device and we feel that we have made a point.

A rundown on the construction makes interesting comparison. The pressure cast

(*Continued on page* 42)

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crankcase is typical front rotary McCoy up to the port belt, except that the intake is longer and the bearing is in the main casting with a removable four-screw rear cover instead of vice versa, and sintered iron replaces bronze for the bushing material. The exhaust stack has a bar across its mouth on the vertical center line to receive a cylinder hold-down screw, and the large bypass has a web in the center to prevent cylinder bulge on the power stroke. The casting finishes at the top of the port belt in a joint face with tappings for three screws. A good feature is that the bypass does not run out into this joint face, but terminates some way below so that the end of the passage coincides with the top edge of the cylinder port, thus avoiding the gas trap and turbulence usually found in this type of construction.

The steel cylinder is ground to fit the casting on both diameter and face, and has very wide ports. The piston fit is excellent with no tight spot at the top, and the bore is not relieved but allows the piston to project considerably at the bottom of the stroke. Three tappings in the head seat alternate with the clearance holes for the main retaining screws, and plasticized gaskets are used at both joints.

The sintered iron piston has a convex crown augmented by a shallow baffle. The skirt is relieved along the portion which projects clear of the cylinder, and one assumes that the virtue of this was found by results because the piston wear pattern clearly shows that tilting occurs on the major thrust stroke.

A drop forged alloy rod of the well-proven McCoy pattern connects up with a tubular wrist pin equipped with the now popular brass eyelet endpads.

The hardened crankshaft has a web of traditional McCoy design but is not ground on the crankpin. A brass pad spigots into the hollow pin to prevent rod scuffing on the backplate and also to catch oil for the rod bearing. The shaft is 7/16" diameter with a 5/16" gas passage and controls admission through a ¼" x 3/8" milled and broadened rectangular port which is fed by a 5/16" intake bore. A non-locking taper conveys the drive through a pressure cast alloy prop driver with drive dimples. A regular McCoy spraybar and flexible ratchet needle take care of the fluid requirements.

The all importance red head appears traditional apart from the simple shallow combustion chamber, and the interesting fact that as far as we know it is the first of all the grown-up Mac heads to have a centrally located plug. Intrigued by this we butchered up a .29 head to the same shape, and drilled a new set of holes in the right places as they are thirty degrees different on the new job, and tried some runs for comparsion. There was no consistent difference so we conclude that the new plug position was dictated by the logical disposition of the tie bolts combined with the appearance of the head fins. All good reasons, but we still like the offset plug.

If pure speed in a fairly constant attitude is required of the .35, a worthwhile improvement was obtained with the test engine by removing the ¼ bore intake restrictor and regular spraybar and fitting the old Redhead jet block and needle assembly. It is necessary to tap the bosses #10-32 to receive them, but the original components can still be used as before when desired. A surprising amount of fuel suction still exists, despite the low air velocity, and the setup is therefore quite practical, especially with pressure feed.

Performance and Handling

Needle control is about the same as with other engines of the same breed, being perfectly progressive as long as the needle is dead straight. The setting does not vary with vibration and the firm has seen no justification for altering the needle valve design for several years. Nor indeed do we. Cold starting is absolutely straightforward as long as the engine is fairly wet. An exhaust prime is essential. Hot starting also requires a prime with an upright mounting but a choke is adequate when inverted. When restarting immediately after a run the flip has to hotly pursue the prime, or choke, because the fuel boils away very quickly. More running might improve this condition. At high speeds the engine was very smooth with the typical Redhead whine, but sounded rather harsh and rough around 11,000. No undue vibration was in evidence and a different fuel or plug may remove this condition. The engine ran steadily and without a change of exhaust note to indicate overheating on all the test props, and gave us the impression that any use which involved load variation would win it many friends.

Test

Plug: McCoy ¼ x 32 long reach as supplied.
Running Time Prior to Test: 1 hour.
Bore: .775 Stroke: .740 Weight: 7 ozs.

Power Prop	*R.P.M.*	*Top Flite*	
10 x 8	12,200	10 x 8	11,400
10 x 6	13,000	10 x 6	12,200
9 x 8	13,350	9 x 8	12,550
9 x 6	14,400	9 x 6	13,400
8 x 8	14,700	8 x 8	13,900
8 x 6	15,450	8 x 6	14,650
7 x 10½	14,700		
7 x 9	15,400		
7 x 8	15,800		

water, water, Everywhere!

(*Continued from page* 26)

equal landing a model flying boat on the step, even if you have only up-elevator control. Nor are you limited to flying only over water. You can install, easily and quickly, tricycle landing gear of simple, rugged design which will permit you to fly over land.

Note that when at rest on all three wheels, your model should nose down about 8 to 9 degrees. Since a model normally glides at about 6 degrees, your model when landing will alight on the main wheels, not on that poor little nose wheel.

On take-offs, the nose will come up and your model will taxi on the main wheels and rudder control will become effective as soon as a little speed is built up.

You'll notice that, when the hull is horizontal, the center of gravity should be directly above the wheel axles. This will give you the condition where the nose will rise quickest on take-off. Don't worry about it tipping back on the tail; the rotation of the model around the main wheel axles to bring the nose down on the ground will move the CG angularly to a point ahead of the axles.

Another dividend of actual cash is the savings in propellers. Mounted high the way they are it takes a real crash to damage them.

While on the subject of props, don't forget to balance yours. It doesn't take much to cause considerable vibration. The writer uses a short length of drill rod sized to fill the prop hub hole, running on two razor blade edges, held in a wood mount so that the prop is free to rotate. Two parallel wood strips clamped to the

bench top and extending beyond its edge will do. Make sure the blade edges are level, using a spirit level for the purpose.

To balance, simply give the light blade a coat of clear dope and allow it to dry. Repeat as necessary. This all takes time, but if you do two or three props at one time, you should have enough to last you a season. It's well worth the effort since it assures correct operation of your relay and escapements.

The writer considers wing tip floats a necessity for a satisfactory model flying boat. Without them a wing tip will drag and it will take a large water rudder to give you control at low speed. At rest the opposite wing will stick up quite a bit and be exposed to the wind which could flip the plane on its back. If floats are made detachable, they can be removed for overland flying.

The First Transatlantic Flight

(*Continued from page* 19)

had been built similar to wings of a smaller aircraft, their weight would have been considerably greater per square foot than in the smaller craft. By careful selection of materials and with astute engineering, N. C. wings weighed only about 1.2 pounds per square foot yet supported nearly 12 pounds per square foot in flight.

Once these basic engineering and aerodynamic conditions were laid out, the designing team behind the N. C. series began to put down lines. The first N. C. began to appear on tracings and blueprints early in 1918. Workmen in the Curtiss Engineering Corporation (a development organization established by Glenn Curtiss separate from the Curtiss Aeroplane and Motor Corporation) began to carve, plane and saw the first N. C. into a practical airplane.

N. C. I Sets the Pace

Although the N. C. boats eventually were used in the Navy's Transatlantic flight, this accomplishment was not the intention for which they were designed. These huge ships were built for the sole purpose of dealing out death to the enemy on the high seas. Design of the first boat, the N. C. I, provided for a crew of five men, 8 machine guns and a varying load of depth charges and bombs, depending on the range over which they were to operate. In modern parlance, the N. C. I could be classed as the prototype and from it evolved the N. C. 2, 3 and 4.

Hull of the N. C. I was 44 ft. 8¾ in. in length, with a beam of 10 ft., and height of 7 ft. 5⅜ in. Evidence of its streamlining to reduce water resistance was the absence of horizontal fins, or "sponsons," on the hull.

Upper wing spanned 126 ft., including the overhang of the balanced ailerons; lower wing measured 96 ft. tip to tip. Both wings had a chord of 12 ft.

N. C. I power plant section consisted of three Liberty engines rated at 330 hp each. These were Navy low-compression type Liberties, designed to withstand the long rigorous hours of naval patrol flying. Four-bladed propellers were 10 ft. 10 in. in diameter. Engines were mounted on streamlined nacelles located between the wings. The central nacelle incorporated a cockpit for the mechanic. He had access to the crew compartment in the hull by way of a scaling ladder and at a speed of about 75 mph for cruising, it was a harrowing experience to climb down to the hull to tell the pilot what was wrong with the engine.

Empennage of the N. C. boats was more than average airplane wing size by itself.

(*Continued on page* 46)

LOOKING SKYWARD?

NO DOUBT YOU ARE WATCHING A MODEL PERFORM WITH THE TORPEDO .09

TORPEDO .09

$9.95

As time goes by more and more model planes are being powered by the TORPEDO .09. It is celebrating its first anniversary and is proving to be just as amazing as its Big Brother Torpedos. Adjectives describing the TORPEDO .09 from the many, many flyers using it are — *"nothing like it"*, *"a sure winner"*, *"can't be beat"*, *"the most power I've seen for its size"* and many others, exclaiming the merits of this powerful, easy starting engine. Watch your favorite model perform like it never did before — Free Flight, Radio Control, U-Control — with the TORPEDO .09

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Fuel is important to your model engine. Every experienced flyer and Champion knows this! Supersonic Fuels contain NO SYNTHETIC LUBRICANTS . . . *only the finest grade of* CASTOR OIL (BAKER AA) is used. Supersonic Fuels are designed to meet your specific requirements and at the same time will treat your engine kindly by reducing wear to a minimum. Both K & B Supersonic "100" and K & B Supersonic "1000" will give your favorite engine **more power, quicker starts and better lubrication.**

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½ Pints	50¢	Pints	85¢
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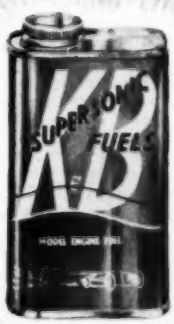

TORPEDO .15

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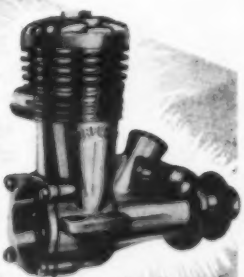

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The biplane arrangement spanned 47 ft. 11 in. (the De Havilland 4 wings spanned just over 42 ft.); the gap to the lower tail plane was just over 9 ft. and three rudders were incorporated between the two.

Fuel capacity of the N. C. I was 300 gallons, enough to keep the craft aloft for 13 hours at a gross weight of about 22,000 pounds, of which nearly 8,000 pounds was payload.

Initial flight of the N. C. I was a sight to see. Never before had a flying boat taken to the air with so much thought and engineering skill behind it. On the morning of November 8, 1918, she took off from Rockaway Naval Air Station with 15 men aboard, bound for Washington, D. C. and, in the afternoon, flew to Hampton Naval Air Station. While perhaps foolhardy to risk so many lives in an untried airplane, the event, nevertheless, testified to the confidence Curtiss and the Navy enjoyed. During tests the N. C. I reached a top speed of 81 mph and climbed to 2,000 ft. in about 10 minutes.

As originally designed, the N. C. I was equipped to carry a crew of five officers and men. Two pilots were seated side by side in a cockpit amidships, where dual controls and flight instruments were provided. A gunner was stationed in the nose of the hull and another gunner was provided with an enclosure in the center of the upper wing. This was the same man who served as mechanic in the cockpit of the central engine and he was provided with a hole in the upper wing through which he could change stations.

By the time the Armistice was declared on November 11, 1918, a scant three days after the first flight of the N. C. I, the handfull of hours on the ship brought out its flaws and redesign was begun. This consisted principally of crew arrangement

and powerplant installation. The variations which evolved into the N. C. 2, 3 and 4 were to further prove certain inadequacies. But the potential of the N. C. series as transatlantic aircraft gripped the imagination of the Navy. The Atlantic still was to be conquered.

Construction was begun immediately on the N. C. 2, 3 and 4. Crossing the Atlantic was the destiny of number 4. With preparations by several nations on the "other side" in progress, the Navy began planning for the first successful flight across the "pond", using the N.C. team.

(Next issue the three new flying boats will be described together with a chronicle of the successful flight of the N. C. 4.—Editor)

Flamingo

(*Continued from page* 28)

RADIO & ESCAPEMENT INSTALLATION: Follow the manufacturer's instructions implicitly. You'll have to open the BCR #3 Receiver (if used) to make the special soldered joint to the back relay contact #5. This is clearly detailed in the installation instructions for the Babcock Mark II Super Compound Escapement to obtain the circuit for operating the Babcock Universal Motor Control secondary escapement. This latter unit is installed using the single needle valve method detailed in the instruction for this unit.

A 3-prong connector is needed to connect wiring from the motor control unit to the primary compound escapement to permit removal of the wing. The female position of the connector can be installed in the hull on the side walls. The third prong on the connector joins the bonding wiring from motor and fuel tank to the ground bus required by the Babcock receiver.

The metal landing gear main wheels are connected to the ground bus. This is accomplished by installing a small brass plate ¾" square on the bottom of the hull which is in contact with the head of the bolt retaining the shock rubber of the gear. This plate is connected to the ground bus by internal wiring.

The gross weight of this model can be reduced approximately 8-10 ozs. by using the minimum battery supply recommended by the manufacturer and by use of light, soft wood in its construction. However, the gain in performance resulting will be gained at the expense of strength and reliability. The lower weight would certainly not call for more than a Torpedo .15 motor.

Test flying over water with limited gas supply is recommended. Any need for CG adjustment will show up on the glide, and thrust adjustment requirements will evidence themselves under power. This model's natural tendency, without right thrust, is to turn left under power.

Radio Control News

(*Continued from page* 17)

ever needed. First of all, the 1AG4 tube, in their Magic Carpet receiver, may be replaced with an Amperex 6007 tube. This 13-ma filament tube is said to provide for even higher performance than the 1AG4. Fig. 2 shows modifications of the 465mc antennas. Both RF chokes on the folded dipole are removed and replaced with wire. The RFC in the red lead of the vertical J-antenna is also removed, as shown. We have made these modifications on our unit and plan to give the receiver a distance check in about a week. So far, we have encountered no trouble of any kind in the operation of our unit which is in-

(*Continued on page* 50)

HERE'S A MODEL WITH MORE POTENTIAL THAN YOU EVER DREAMED OF!

The FLITE STREAK Will *Actually* Do *Everything* We Claim it Will!

FLITE STREAK GAS KIT by TOP FLITE

COMBAT or STUNT TRAINER

Designed by George Aldrich, America's Greatest Stunt Champion!

KIT No. N-2 only..... $3.50

FLITE STREAK is a Top Flite exclusive.

SPECIFICATIONS:
Wing Span: 42 in.
Wing Area: 390 sq. in.
Length: 28 in.
Engine Sizes: .15 to .35

The FLITE STREAK with a hot combat .35 engine will give you terrific speed plus unexcelled maneuverability . . . and with a .15 thru .25 engine its advanced design gives the beginner a perfect stunt trainer. As a contest combat model, as a stunt trainer, or for pure Sunday fun in flying—the FLITE STREAK CAN'T BE BEAT!

KIT CONTAINS:

- Full length shaped and notched leading and trailing edges and spars
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- Complete detailed plans with many step-by-step construction features making it easy to build and fly.

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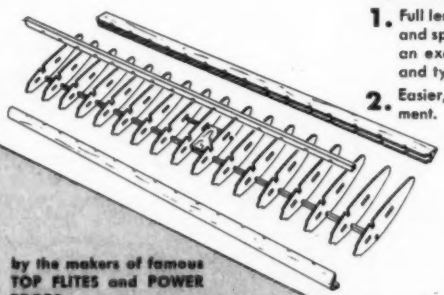
1. Full length leading, trailing edges and spars. Require NO SPLICING, an exclusive feature for this size and type of model.
2. Easier, faster and perfect alignment.
3. This Jigtime construction of notched spars, leading and trailing edges allows you to construct a symmetrical wing on a flat surface without special jigs—also making it warp resistant.



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. . . the props of Champs!

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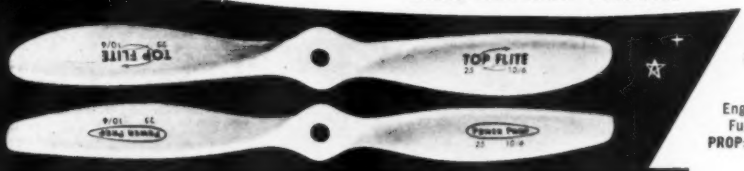


ALL THOSE LISTED ARE FIRST PLACE WINNERS!

½ A SPEED SENIOR
Allan Brooks
Tacoma, Wash.
Speed: 87.35 mph
Engine: Cox .049
Fuel: Thimble Drone R
PROP: 4½-7 POWER PROP
Plane: Original

FAI GAS JUNIOR
Gary Feekes
Cedar Rapids, Iowa
Time: 17:33.3
Engine: K&B 15
Fuel: Hells Fire
PROP: 8-3½ TOP FLITE
Plane: Lucky Lindy

FAI GAS SENIOR
Donald Gurnett
Fairfax, Iowa
Time: 21:48.1
Engine: Webra 15 Mach 1
Fuel: Own Mix
PROP: 9-6 TOP FLITE
Plane: Lucky Lindy

FAI GAS OPEN
Daniel Sobala
So. Hadley, Mass.
Time: 22:08.5
Engine: Oliver 15
Fuel: Ohlsson
PROP: 9-5 TOP FLITE
Plane: Original

STUNT JR
Bob Winks
Cleveland, Ohio
588.0 points
Engine: Fox 35
Fuel: Own Mix
PROP: 10-5 TOP FLITE
Plane: Thunderbird (mod.)

COMBAT JUNIOR
Robert Krakauskas
Little Falls, N. J.
Engine: K&B 35
Fuel: O&R 2
PROP: 9-7 TOP FLITE
Plane: Original

FLYING SCALE CL JUNIOR
Gerry Ferguson
Valley Stream, N.Y.
197.2 points
Engine: Fox 29
Fuel: Testor
PROP: 9-7 TOP FLITE
Plane: Berkeley T-28

FLYING SCALE CL SENIOR
Michael Burke
Louisville, Ky.
237.4 points
Engine: K&B 29
Fuel: Exothermic
PROP: 10-6 TOP FLITE
Plane: Corsair F-4U1 (mod.)

FLYING SCALE CL OPEN
Tom Dean
Corpus Christi, Tex.
347.2 points
Engine: Cameron 19
Fuel: Supersonic 1000
PROP: 9-6 TOP FLITE
Plane: Original

NAVY CARRIER SENIOR
Robert Heminway
Audubon Park, N. J.
499 points
Engine: McCoy 60
Fuel: Own Mix
PROP: 11-8 TOP FLITE
Plane Skyraider (orig.)

NAVY CARRIER OPEN
C. Stephen Babin
Fairview Park, Ohio
520 points
Engine: McCoy 60
Fuel: Own Mix
PROP: 10-9 POWER PROP
Plane: Original

A GAS FF SENIOR
Rudy Kluiber
Cleveland, Ohio
Time 30:07.5
Engine: Torp 19
Fuel: Nitro X
PROP: 9-4 TOP FLITE
Plane: Spacer

B-C GAS FF JUNIOR
Alan Whitman
Spartansburg, S. C.
Time: 11:36.4
Engine: Torp 35
Fuel: Supersonic 1000
PROP: 11-4 TOP FLITE
Plane: Ram Rod 750

R.O.W. GAS OPEN
Robert Kleinfelder
Hamilton, Ohio
Time: 12:00.0 (new record)
Engine: K&B 15
Fuel: Cheminol
PROP: 8-3½ TOP FLITE
Plane:Zipper (mod.)

CLIPPER CARGO
Donald Gurnett
Fairfax, Iowa
Wt. Lifted: 100¼ oz.
Engine: Thermal Hopper
Fuel: Thermal Hopper R
PROP: 6-3 TOP FLITE NYLON
Plane: Pelican

R.O.W. GAS JUNIOR
Larry Willis
Columbus, Ohio
Time: 8:14.3
Engine: Atwood Shriek
Fuel: Thimble Drone
PROP: 6-3 TOP FLITE
Plane: Yo-Ho

R.O.W. GAS SENIOR
Robert Nichols
Meriden, Conn.
Time: 9:34.1
Engine: K&B 19
Fuel: K&B 100
PROP: 9-4 TOP FLITE
Plane: Spacer

AMERICA CL PAA LOAD JR-SR
Harold Thompson
Miami, Fla.
Time: 10:38.7
Engine: Atwood .049
Fuel: Nitro X
PROP: 6-4 TOP FLITE
Plane: PAA Master (mod.)

RADIO CONTROL (RUDDER)
Richard C. Allen
Apalachin, N. Y.
106.5 points
Engine: Fox 35
Fuel: Fox
PROP: 10-6 TOP FLITE
Plane: Lancer

RADIO CONTROL PYLON RACING
Keith Storey
Pasadena, Cal.
24.3 points
Engine: Oliver Tiger 15 Diesel
Fuel: McCoy Diesel
PROP: 10-6 TOP FLITE
Plane: Bonzo (orig.)

STUNT OPEN
George M. Aldrich
Tyler, Texas
618.0 points
Engine: Fox Stunt 35
Fuel: Fox Superfuel
PROP: 10-6 TOP FLITE
Plane: Nobler

COMBAT OPEN
Joe Kastetter
Clifton, N. J.
Engine: Fox 35
Fuel: Own Mix
PROP: 9-7 TOP FLITE
Plane: Original

A GAS F.F. JUNIOR
Suzanna Allen
Valley Stream, N. Y.
Time: 13:43.9
Engine: Atwood .051
Fuel: K & B 1000
PROP: 6-3 NYLON TOP FLITE
Plane: Ram Rod

A GAS F.F. OPEN
Don Assel
Canton, Ohio
Time: 30:05.2
Engine: K & B 15
Fuel: Thimble Drone R
PROP: 8-4 POWER PROP
Plane: Original

HELICOPTER
Parnell Schoenky
Kirkwood, Mo.
174.12 points
Engine: Atwood .049
Fuel: Cheminol AA
PROP: 6-3 POWER PROP
Plane: Original

½ A GAS F.F. SENIOR
Rudy Kluiber
Cleveland, Ohio
Time: 22:15.0
Engine: Thermal Hopper
Fuel: Clear Magic
PROP: 6-3 POWER PROP
Plane: Ram Rod 250

C.L. ENDURANCE OPEN
Tommy De Ville
New York, N. Y.
Time: 1 Hr. 35:19
Engine: Fox 25
Fuel: Testors 39
PROP: 11-5 TOP FLITE
Plane: Original

stalled in a boat. Just turn on the switch and you're in business.

Fig. 3 shows the system used by Mr. Kelly Day, Wappinger Falls, N.Y. to obtain three functional channels from a single-channel receiver. Using a pulse width/pulse rate circuit for keying the transmitter, which may be any regular carrier or tone transmitter, you are able to pick up any of the three relays at will. This system has been in use in various boats for over a year and has proven very reliable. There is nothing critical about the layout of either the receiver or transmitter section. We have never seen anything in print which clearly defines "single channel"; however, our interpretation puts this system into the single-channel class. We feel that a single-channel system relies on but one relay, which is actuated by either an RF or AF signal. Once past this initial relay, anything goes.

The DCRC Newsletter, published in Kensington, Md., has presented some interesting data as compiled by Nate Rambo, and shown in Fig. 4. Chart A shows the preferred weight of an RC model versus square foot of wing area. When the weight gets above the curve, performance in general decreases. In other words, keep the wing loading light. This is also advocated by Hal deBolt. Chart B shows the preferred engine size versus square foot of wing area, the optimum engine size being selected between the two curves. From our experience we feel these are very accurate curves.

Also in the Newsletter, and submitted by Al Diem, is the possible solution to interference caused by improper bonding. This condition is noticeable when the engine is running and is manifested by an erratically operating receiver. Al specifies the trouble as traceable to the motor control when the engine is running. The solution is to slip a piece of spaghetti (insulation from wire will do) over the drive pin of the motor escapement. Two dissimilar metals will produce a voltage when rubbed together, and there is often a dissimilarity even between two like metals.

Before closing Tech Topics we'd like to throw in our two cents on the subject of frequency allocation. The Modulator (Pioneer Radio Controllers) is of the opinion that a band from 26.995 to 27.255mc is not sufficiently wide for reliable operation of more than one channel. We'd like to point out that the British RC fans use super-het receivers which are crystal controlled. This allows side-by-side operation within 15kc. True, this type of receiver is more complicated and would not lend itself to a reed type receiver too readily, but single-channel work is quite feasible. These systems operate on a 1 to 2mc IF frequency and therefore could be readily transistorized. The ideal set-up for RC work would be a band of about 3 to 5mc in width. Get your FCC registration in so we'll have a chance.

CLUB NEWS

The New England RC Modellers, 50 Oxford Street, Auburn, Mass., has increased membership from 15 to over 75 in the past three years. The main reason for this growth is that movies on RC and aviation subjects are shown at each meeting, original RC equipment is brought in and discussed and monthly flying sessions are held. Prizes are given for various events, not generally covered by regular contest flying. Contact Fred MacCounell, the secretary, for further information.

The DCRC group is exchanging newsletters with other RC groups around the country. This idea should keep everyone pretty well up to date on RC happenings, circuits, etc. Of all clubs in the country, we believe the DCRC group presents more technical and circuit data than any other. Plenty of ideas on batteries and power sources from this active organization. If you want to exchange newsletters, contact the Editor, Don Clark, 4202 Brookfield Drive, Kensington, Md.

Mr. R. W. Thwing, Bendix International Div., Bendix Aviation Corp., NYC advises that he monitors 27.255kc on his National HRO Communications Receiver and has noted the following: considerable drifting of keyed transmitters, both tone and simple carrier types and the need for closer control of this problem, especially if a narrow band is given us by the FCC. Some carriers shifted as much as 3 to 4kc from the time the key was depressed until the carrier was well established. At other times, momentary pulses were missed and the carrier would come on full strength, after the key was held down for a second or so. This condition is generally caused by heating up of the crystal when keyed, and is most common in keyed crystal controlled oscillators which are directly coupled to the antenna. The best solution is given by Mr. Thwing and is as follows: Connect a #48 or 49, pink bead flashlight bulb in series with the crystal. Solder one side of the bulb directly to the crystal socket, to minimize lead lengths. Adjust the circuit to obtain *minimum* RF current through the crystal and still maintain good output and keying characteristics. This may be done by varying the grid leak and possibly the tank circuit and screen voltage. With the frequency spectrum as tight as it is, we should all stay within the limits established by the FCC. Lost pulses and drifting transmitters can also cause loss of control.

Frank Hoover, CG Electronics, sends photo of his Shellenbaum Bomb. Eight-channel simultaneous control is used for rudder, elevator, aileron and positionable throttle. Using a 90% symmetrical airfoil, Frank flies it with ailerons, which have equal travel in both directions, and uses rudder for take-off only.

Frank advises that a big two-day RC contest will be held in Albuquerque on October 19th and 20th. This will be AMA sanctioned and will have rudder only and multi-channel classes.

The LARKS of Los Angeles are out to get the endurance record for RC. The John Broadbeck trophy has been passed on to little Don Davis who kept his K&B .15 powered Live Wire Champion in the air one hour 1⅝ minutes. Fuel load was in the wing tanks and in the fuselage tank; total weight of plane and load was 4 pounds 3 oz. Only 3 channels of a CG 5-channel unit was used for operating a British servo on the rudder and a Bonner escapement for the exhaust restrictor. Batteries used were 6 pen-cells and one Burgess U-20.

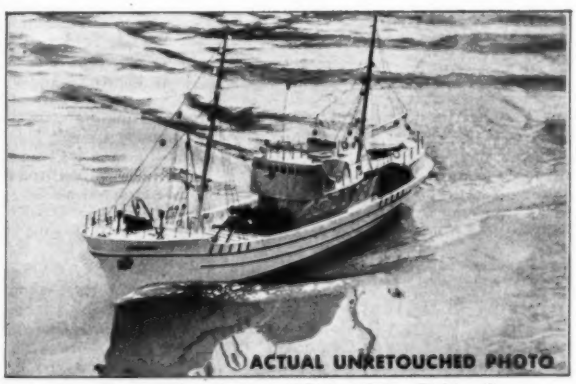
If certain clubs around the country think they have a novelty event, we guarantee they won't stand a chance against flying at Doc Hauck's Flying Circus. Sky writing, glider release, glider pick-up, blind flying and landing, mid-air transfer, friendly combat (?), hanky pick-up and, well we could go on and on but who'd believe it. Along this line they will also look for "Con Cours De Elegance"—pit neatness. Before leaving the LARKS nest, they are to be congratulated for their Novice Class event, held at most flying sessions and contests. This event gives the newcomer a real in to RC work without having him compete against the experts,

(*Continued on page 52*)

Exciting News for Every Modeler! Perhaps the cost of building and operating your own complete R/C models has stopped you, like thousands of others, from enjoying the incomparable thrills of radio-control. Now, for the first time, complete packaged R/C is available at budget prices—from the world's most respected manufacturer of quality radio equipment and pre-fabricated model kits!

BABCOCK BREAKS THE R/C COST BARRIER!

Now at Affordable Prices—2 Authentic-Model Kits—Complete with all Radio-Control Equipment



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31½" Scale Model of 63' Offshore Yacht

Complete Control: RIGHT, LEFT, START, STOP!

NEW "NORTH STAR" TRAWLER

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Here is the proudest masterpiece we've ever designed. Yet it's fully equipped for authentic, realistic action—completely controlled by you! Easy to assemble and operate: complete instruction book included.

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- Deluxe "North Star" Trawler Kit
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Only **$75.95** complete!

$85.95 with factory-assembled radio kits
Boat Kit only, $16.95—complete with propeller, etc. Deluxe fittings, $9.95

NEW "LITTLE BREEZE" DIESEL YACHT

A breeze to assemble! Simple, perfect-fit parts make this kit especially ideal for the new R/C enthusiast. It features authentic deck and superstructure of die-cut mahogany plywood; one-piece, high-impact molded styrene hull; and chrome-plated marine hardware, realistic in every detail. Easiest-driving hull for electric propulsion. Best of all, it's priced to fit the most modest pocketbook.

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- Complete "Little Breeze" Yacht Kit
- Authentic Chrome-Plated Marine Hardware
- Complete Radio and Actuating Devices: Transmitter, Receiver, Compound Servo (see bottom of page)

Only **$69.95** complete!

$79.95 with factory-assembled radio kits
Boat Kit only, $19.95 (complete with all fittings)

Both Kits Include All Radio and Actuating Devices

"MAGIC WAND" TRANSMITTER

Powerful, versatile! Examination-free—27 mc. 6⅞" x 2⅛" x 2⅞". Available individually at $19.95 (factory-assembled, $24.95).

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Weighs 2 oz. Only 2" x 3" x 1¾"—yet unmatched in range and sensitivity. Available separately at $21.95 (factory-assembled, $26.95).

ELECTRIC COMPOUND SERVO

Exclusive electrical cams! Positive control of motor (start and stop), rudder (right and left). Available individually at $8.95.

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FULL-SIZE PLANS

EACH SET OF PLANS FOR 25c

☐ WINNIE MAE: Lockheed Vega ukie, .049.
PELICAN: Willard flying boat, .049.

☐ VICTOR SCOUT: Scale control, .075.
SUPERMARINE: Ducted fan job for .09.

☐ THE SPACER: Class AB free flight.
STUMPY: .09 combat U-control.

☐ BEAVER: .19 - .35 scale.
ZENITH: Taibi A free flight.

☐ EL DIABLO: .19 - .35 stunter.
TRI-PACER: Scale ukie Piper.
PLAY PLANE: All-balsa FF, .049.

☐ HALF WILD GOOSE: .049 free flight.
FIRECRACKER: .29 scale.

☐ LONG TOM: .29 - .35 free flight.
SIDEWINDER: .049 profile ukie.

☐ SKEETER: Half-A scale team racer.
INTERNATIONALIST: FAI (.15) free flight.

☐ BOUNDER: Record .29 speed.
ZEPHYR: .049 free flight.

☐ HOTTER 'N THAT: .29 combat.
SUPER SAUCER: Large towliner.

☐ SKY WING: .049 flying wing.
CHALLENGER: .29 team racer.

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MODEL AIRPLANE NEWS

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such as Bonner with 245 pts, Dunham at 235 pts, and Root with 185 pts.

The East Bay Radio Controllers, through their newspaper the Carrier, report that multi-channel flying has gained in popularity due to excellent design of the Orbit and CG equipment. Bill Page took first place in the Novice Multi and then could have picked up the prize for the worst clobber job. In a power dive, under full throttle, his wing peeled off at 200 feet.

We were visited by Mr. T. Vincent Anthony of Park Avenue, Liverpool, England, recently. The main problem with the English RC equipment builder is his lack of suitable components. Mr. Anthony was amazed at the size of some of our components and it was agreed that if the English builder had his choice of parts, we would be hard pushed in the circuit design field. Super-het receivers are used quite a bit for boat work, with reeds still being the choice in the multi field. "TV" had some beautiful color shots of his boat which gave a variety of controls from a single-channel receiver. We hope to give you some British ideas in the RC field shortly.

From behind the iron curtain we obtained a modeling magazine which indicated a fair amount of RC activity. In addition to some fine looking original designs, one RC flier was shown with his Berkeley Bootstraps. We don't have the RC equipment section translated. However, they featured an extremely small hand-held transmitter on 27.120mc. A transformer coupled twin-tube receiver gives a relay current change of from 2ma to 11ma. Pneumatic actuators were mentioned and next month we'll give you full details on the equipment mentioned. Planes were conventional.

NEW ITEMS

A German-designed actuator, known as the Telematic-Alpha, may make its appearance in the USA in the near future. A fully enclosed unit, weighing 2.5 oz., it will give left when keyed once and right when keyed twice, with automatic return to neutral. Response time from full left to right is but .35 seconds. The motor current drain is only 70ma, under full load, and then the time of current drain is but .3 seconds per operation. No current is drawn by the actuator when it is in a control position.

Ace Radio Control, Higginsville, Mo., now stocks the Philco AO1 Transistor, $2.95 each. This unit will oscillate very well at 27mc and in some cases up to 40mc. In view of the interest in RC boats throughout the country, Ace RC has prepared a boat "doodling sheet." This sheet lists various boats and the RC gear needed for various types of operation. The Jernberg ½ Tone receiver is also kitted by Ace. For you newcomers to RC, don't forget to check with Ace Radio Control for those hard-to-get and special components you sometimes run into. All types of crystals, quench coils, coil forms and miniature and subminiature components.

ESSCO RC Products, 58 Walker Street, New York 13, N.Y. has a transmitter antenna which, when closed measures 17", when extended, 10½ feet. The price is $3.95, complete with mounting base. If you boat fans are looking for a battery that will really put out, and still provide the ballast so often needed in large boats, ESSCO has a Willard 25amp/hour, 6-volt battery. Weighing 8 pounds and measuring 2½" x 6½" x 7½", it sells for $9.95. It is claimed that it may be operated in either a horizontal or vertical position.

Also from ESSCO, is a new 2v 1amp/hour cell which compares favor-

ably with a Silver Cell but costs about ¼ as much. We'll have a report on this item shortly.

Now that RC work is getting into the fabrication of cases for receiver, transmitters and other housings, the following items can assure you of greater precision and factory appearance. Radio Ham Shack, 167 Washington Street, Boston 8, Mass. has three items of interest: An 18" bending and forming brake for bending neat covers, housings etc.; model number R-11001 sells for $19.95. Next, is a notching and nibbling unit for $16.95; this unit allowing you to make up to a 1" x 1" notch in 16-gaguge metal (just the thing for box corners). The last item is a 4-in-1 tool which may be used for riveting, punch press, shearing and forming. Forming and shearing operations are limited to 1" width in 16-gauge stock. This model, number R-11003, sells for $12.95. If you can't afford these items yourself, why not get them as a club?

Not a new item for RC use but we thought you'd be interested in a transmitter built by the Electronics Division of Fairchild Controls Corp. Operating on from 280 to 322mc, this unit is built into a standard sardine-sized can, uses printed circuitry throughout and will transmit to a distance of 25 miles, continuously, for 24 hours. This is a transistorized unit and shows the trend toward miniature and sub-miniaturization. Already, we have Citizenship and Babcock with smaller-than-usual transmitters. Here again it shows that a great deal of power is not required for reliable operation.

Hank Bourgeois of the DCRC group has purchased quite a few Nickel-Cadmium batteries from the Nickel-Cadmium Battery Corp. of East Hampton, Mass. Very small in size and weighing but 1.3 oz., this cell, #AVN4J, is nylon encased and can be charged and discharged at very high current rates without damage. A filler cap acts as a safety valve to internal pressure build up. Look to Ace Radio Control for these cells near the end of summer. Ideal for actuator use or for filament supply for that sub-miniature transmitter you might build.

Two photographs show the transmitter and receiver by CG Electronics of Albuquerque, New Mexico. This is 8-channel equipment for simultaneous control. The 9 oz. receiver is completely transistorized. The transmitter has dual 4-position stick controls, using separate modulators, hence the simultaneous control feature. This system has been field tested for over a year. Transmitter price is $99.50 and the receiver is $139.50.

Crestcraft Products, 59 Crestwood Blvd., Poughkeepsie, N.Y. reports interest in the printed-wiring chassis for the ½ Tone receiver are being widely accepted. This chassis comes completely drilled and with component locations screened on the back, instruction sheet and flea clips for only $1.00. The manufacturer promises to supply other printed patterns for other receivers and transmitters which are published. This ½ Tone receiver was described in the July issue of MAN and was designed by Bob Jernberg. We have used various subminiature tubes in the printed version, with a total filament drain of less than 50ma. (Editor—See correction ½ Tone schematic, page 7, September MAN.)

Next Month
1957 NATIONALS STORY

Streak

(*Continued from page* 23)

modeling group saw the simplicity of construction possible with a flying wing. Probably like the majority of modelers, our first approach was a straight untapered wing with an engine mounted just ahead of the leading edge and an elevator hinged at the trailing edge. Several models of this type were built, varying span, chord and CG location. Results of this type wing were reasonably good, but in general it did not fly as reliably smooth through maneuvers as we felt possible. We were not sold on this shape or area distribution as the ultimate in flying wing performance.

Because of their simplicity and ruggedness, we did not give up. Comparing our knowledge of normal stunt ships, extremely short-coupled stunt ships and flying wings, we decided that the flying wing is certainly short enough to turn good and tight. We wanted a more stable design capable of very high performance. Stretching out the chord and shortening the span was not the answer. How about tapering the wing keeping the span the same but lengthening the center chord to make up for the area needed? That's exactly what we did. The earlier Half-A version employed a straight leading edge, tapering from the tips to wide center chord. This flew very well, but required a bit of lead weight at the trailing edge to attain maximum performance. For structural reasons we wanted to mount the firewall on the leading edge. Instead of moving the engine back to eliminate the need for ballast, we chose to move the wing area foreward. This also allows for a more batlike appearance for our model. With the area concentrated foreward stability is gained in the same manner as it is with a normal airplane, with its supporting wing area also located foreward of its control surfaces.

Now one more point. In a normal airplane, there is an air space between the trailing edge of the wing and the control surfaces while the flying wing is one continuous supporting area. This is remedied by the balanced elevators on our model allowing a smooth flow of air over the top and bottom surfaces of the elevators when extra tight maneuvers are performed. Without balanced elevators turbulent air flow would exist at the top elevator surface when extra tight inside loops are performed. This turbulent air flow is greatly relieved by the airstream admitted when balanced elevators are used eliminating bucking or jerky motion when extra tight maneuvers are performed. With the control hook-up shown, the original would not mush or slow down when full control was given.

The results of this style flying wing will speak for themselves. Besides many bigger wings, this is the third in a series of Half-A flying wings built employing this foreward concentration of wing area and balanced elevators.

Now let's get back to the amateur model builder. To him extra high performance is not of too much value. He will become interested in this design for two reasons, these being the simplicity of construction and the somewhat different batlike appearance. He does not want a sensitive model or one that is overly fast. Because the sensitivity of a model is greatly effected by the CG location, we strongly advise the newcomer to move the CG foreward of the position shown, say by ¼". This is easily accomplished. Because the Junior Streak is so light, a small amount of ballast effects the CG location considerably. By simply using a bigger or smaller spinner, a noticeable change in CG location will be noted.

As for speed, we advise the beginner to use an older or not-too-hot Half-A engine in this model. If you want to use a hot engine, we advise slowing the engine down by running it on the rich side or by using an inefficient prop until you get used to this model, then "let her rip." This design is quite rugged, so don't be afraid of rough handling. The original has hit full power straight in with the only damage being a broken prop. This was done only to prove a point to doubting fellow modelers. We do not advise it as a common practice!

Now, lets dig in and build our little monster. As you see by the plans, there are few pieces and construction is simple for this model.

Begin by cutting out the leading and trailing edge and all wing ribs. Crack the leading edge where shown and sweep foreward ½" at tips. Pin the leading edge down and cement scrap balsa reinforcements over the two cracked joints which allow for the foreward sweep. Keep in mind that the outer wing panel is ¼" shorter than the inner wing panel. (Because of this, the outer panel rib spacing will decrease slightly to make up for the ¼" difference; ribs are spaced evenly in both inner and outer panels.) Now pin the trailing edge components down and cement. Use a firm piece of ¼" balsa for this.

When the leading edge and trailing edge are dry, you are ready to assemble the model. Cement all ribs in place in the leading edge. When dry add the trailing edge. Check for alignment, giving a minor twist if necessary.

Now you are ready to assemble the center section. Cut fuselage sides and F2 from 1/16" sheet and the firewall, F1, from 3/32" plywood. Slide the fuselage sides in place alongside the center ribs and cement. Solder motor mounting nuts to a tin plate and cement this to the rear of the firewall. Install the firewall, noting out-thrust, and cement. The .045" wire skid may now be bolted in place as shown.

Before putting F2 in place, build a fuel tank from scrap tin as shown. Install this and then insert F2. Pay attention to alignment of the center of your tank with the center of your intake. If a Thermal Hopper is used, the tank will have to be moved back some to allow for the intake tube. Dope the inside well if this engine is used.

Now you are ready to cut the bellcrank mount from 1/16" plywood and cement in place. Please note that this mount extends under the fuel tank and is cemented well to both fuselage sides. With this in place, the center section may be completed by adding the 1/16" sheeting. It is advisable to cover F1 and about ¼" back over the fuselage with cloth for extra "crack-up" resistance.

Add wing tips, T1. Now is as good a time as any to sand the L.E., T.E. and center section to shape.

The control system now may be installed. Cut elevators from ¼" sheet and hinge at the three points indicated. Mount the bellcrank and form the control horn by looping a piece of .030" wire over the pushrod twice, inserting the two ends through the elevators and bending over and cementing in place. This method is simple and will eliminate any unnecessary play at the control horn. Don't forget the 1/16" sheet pushrod guide. Install tubing in tips for lead-out guides and then install leads. We advise leaving one lead about 3½"-4" longer than the other to avoid the possibility of one interfering with the other while flying. Cement in the four 1/16" fillets as shown, add a small amount of outer wing weight and finish sand all surfaces.

Cover the model with Silkspan and

(*Continued on page* 56)

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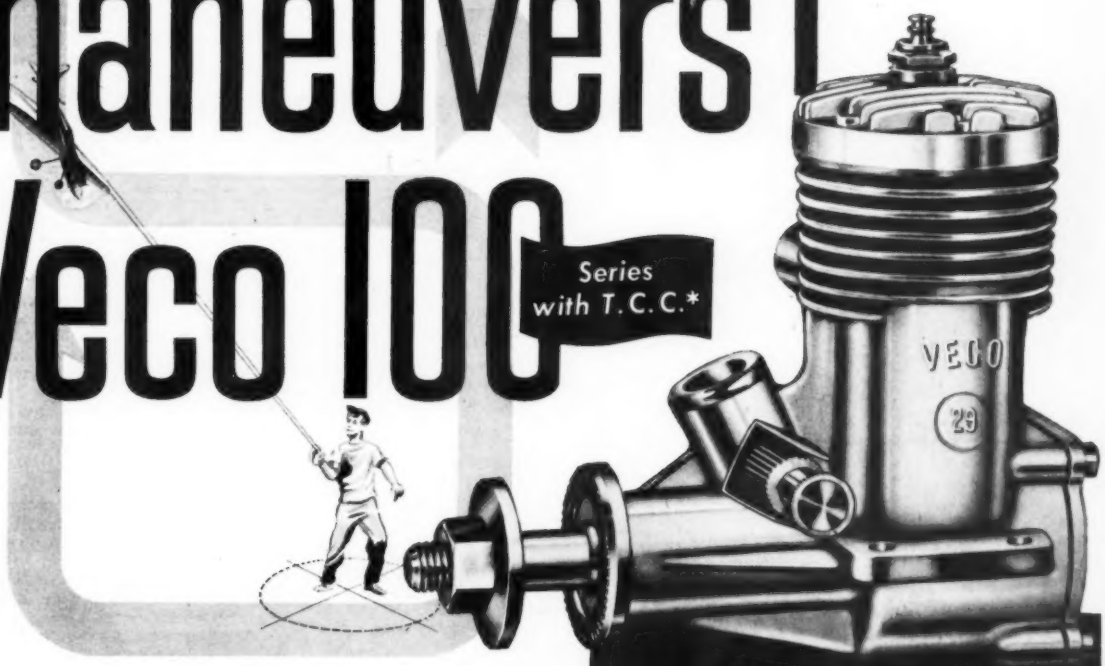

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apply two coats of fuelproof dope. Cement the twin rudders and sub-rudders in place. You may now finish doping to your own liking. The original was covered with yellow Silkspan and finished with about five coats of medium-thin clear butyrate dope and trimmed with black.

We used an Atwood Shriek in the original with a 6-3 Top-Flite plastic prop, Thermal Hopper fuel, on 26' dacron lines with a small nylon (Sullivan) control handle. (These may be rolled up on cardboard and held to the wing with a rubber band for storage.) This proved to be a hot combination. Try flying one level at 70° and keeping up with it if you use a similar combination!

Launching has been quite trouble free. Have your helper point it slightly up and slightly out. Hold a little up control on it and let it go. Good luck and good flying.

BILL OF MATERIALS

(Balsa unless otherwise specified)

1–1/16" x 3" x 36", ribs, fuselage sides, center sheeting, rudders; 1–⅛" x 2" x 36", trailing edge, tips, elevators; 1–⅜" x ⅜" x 36", leading edge; 3/32" plywood for firewall; 1/16" plywood for bellcrank mount; Perfect bellcrank; .012" wire or substitute for lead-outs; .045" wire for pushrod, skid; .030" wire for control horn; aluminum tubing for lead-out guides; tin for gas tank; brass tubing for gas tank; cloth for hinges, nose reinforcement; cement; Silkspan for covering; clear and colored fuel proof dope; mounting bolts; solder; lead ballast; 1" plastic spinner or size to your liking.

Two by Air

(*Continued from page* 12)

and friendly, and they certainly make for a more casual life in Africa. Even the wives of our modeling friends can follow the sport more closely because they never have to wash dishes, make beds, etc. Some felt that American wives are mistreated by having to do so much housework!

The population of South Africa is made up of natives (who work as servants, and in the diamond and gold mines) and a smaller number of Dutch and English. The natives live in separate areas called "compounds" and laws prohibit them from entering the Dutch and English area, and likewise the Dutch and English are prohibited from entering the native areas.

At the end of the tour Monte set up a farewell party, and everybody talked happily about how successful the tour was and expressed gratitude for our efforts. Howard and I were both happy to have helped in advancing the progress of the hobby and having such unique experiences. Our flying helped make the demonstrations successful, but it was the planning and enthusiasm of the people from Jix Limited, the announcers, and many others that made the tour a success. Monte taxied us for the last time to the plane for London and we left with memories of friends, places, and flying experiences that will never be forgotten.

In London we were guests of the British magazine, Aeromodeller, and we were met at the Airport by Ron Moulten. They

took us on many visits to English kit makers, the E.D. plant, the Mercury engine plant, and others, for five days. In general, the assemblers in the British plant seemed to be more highly skilled than their American counterparts, but they had not set up for the more automation-type of U.S. production, to get out more units in fewer man-hours.

Finally, on our last day in England, we made demonstration flights at the Duke of Bedford's estate, before a crowd of about 3,000 and were again enthusiastically received.

We arrived home on May 10, having traversed a large portion of the earth, with all travel from New York being made on Sabena Air Lines. Our models were shipped on Sabena as excess baggage, and air freight, and they arrived in perfect condition and on time.

In conclusion, I feel that the tour showed that model builders are the same friendly fellows all over the world, and that we have a common bond everywhere because we are all working at the same goal of developing more skill, and more friendly competition. I've heard it said and it seems reasonable that 'if everyone in the world built models and flew in contests there wouldn't be any wars."

About exhibition flying, I feel that the tour showed much can be accomplished. With special effort, models can be a terrific crowd-pleaser, and the response indicated many possibilities for exhibition flying in the future. County fairs, coliseum shows, demonstrations at high schools and colleges (these now pay lecturers and the like), even for participating in parades (with RC) are all future possibilities indicated by the success of our demonstrations before the general public in Africa.

Most model flyers, including myself, are happiest to build and fly just for our own pleasure, without trying to thrill any spectators, and our contest rules reflect this. Things that cause non-modelers to lose interest in control line are the three-minute starting allowance, level flight laps, and the primary maneuvers. In RC, the precision pattern, and stunting at high altitudes are likely to discourage Joe Public from watching, because he lacks knowledge of airplanes and can't visualize what the pilot is going through.

Exhibition is apart from the true spirit of modeling, but it is a way to attract new starts to the hobby, and it could provide more travel, and even pay, to skilled modelers, if the response we found in Africa can be duplicated elsewhere.

The Upstart

(*Continued from page* 14)

trace the fuselage sides from the plan, marking the position of the formers. Cement the ¼" sheet doublers and longerons to each side. Pin the right fuselage side flat to the work surface. Cement the nose blocks, tank and landing skid assembly in place. (Drill a hole in the work surface to clear the tank filler and vent.)

The formers are all cut from 3/32" x 1" stock and notched to clear the longerons and doublers. When all the formers are cemented in place, prop up the rear of the fuselage ½" and cement the left side over the right. Weight and pin in place until thoroughly dry. Then remove the assembly from the bench and add the planking, fin, etc. Note that the top and bottom planking is applied with the grain running across the fuselage.

The ¼" plywood motor mount bulkhead and nose should be coated with cement several times before the final cementing and assembly. If the surfaces are properly pre-cemented and mated accurately, the engine will never pull loose.

The wing and stabilizer should be securely keyed in place with 3/16" x 1/16" x ½" hardwood strips cemented to these surfaces opposite the four corners of their respective platforms.

Before test flying, remove any warps with heat (actually this should be done daily as the wing and stabilizer cure). The fin should be warped slightly for a left turn and very slight wash-in in the right wing panel is desirable just in case everything is not absolutely flat. The engine should have approximately five degrees downthrust and slight left thrust. Place a straight edge parallel to the stabilizer and measure to see that the wing leading edge is 5/16" higher than the trailing edge.

(*Continued on page* 60)

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Balance as shown and you are ready to test fly. Use a 10" diameter 5" pitch prop (Y&O preferred). On these big jobs the low pitch props make the engine sound hot but the airplane gets no place. With the engine running slowly, four-cycle, the Upstart should have a very wide right circle and fairly flat climb. Trim with tab if necessary until this is achieved. Do not vary engine thrust for directional trim. Increase engine power to just under two-cycle operation and she should climb up in a steep, wide, right spiral. Under medium power it will probably dip sharply when the engine cuts so watch to see that the recovery is reasonably rapid. If not, shim up the rear of the stabilizer. If she looks all right, use about a ten-second motor run, open everything but the tool box, and VTO down wind. The angular difference specified may be more than desirable, so shim up the front of the stabilizer 1/32" at a time until you achieve about three or four complete circles in 20 seconds. When the engine cuts, the Upstart should slip out on top with no dip.

Now that the climb is in the groove, trim the glide if necessary by adding weight to the nose or tail. Tilt the stabilizer for desired glide turn (Model turns toward higher side in glide). The original checked out in three flights with no adjustments of any kind necessary.

This design thrives on power so use the hottest engines available. The author prefers the new Johnson and uses the .29 in the new Upstart and the .35 in the other. However, since these ships usually weigh only 30 to 32 ounces the Johnson .29 or .32 makes an excellent combination for class B-C competition.

For full-size plans of smaller versions address the author in care of this magazine.

Foreign Notes

(*Continued from page 30*)

mentioned Italian contest, the British Nationals featured a team eliminator for the World Speed event. In this, World Champion Gibbs once again proved an easy top-place winner with 120.4 mph, using the one and only Carter-McCoy Nipper motor. Other contestants were either right off form or right out of luck, resulting in a record low in qualifying flights and a problem for the team selectors. Motors used included the Italian Barbini B.40TN and two or three glow conversions of the modified type Frog 249.

The "A" teamrace resulted in another win for Oliver exponent Dick Edmonds with a time of 8:12.5 for the ten miles. This was only 13.5 seconds slower than the winning time in Class B which was by Tuthill and Walker with a 100-mph-plus modified Eta 29 job, from McGoun flying a Carter-tuned McCoy. Stunt was once again won by Pete Russell.

The two radio events ended in wins for Honnest-Redlich and for Nixon who won

both events last year. RC does not progress very fast in Britain and looks much the same from year to year.

Japan

Illustrated is the Japanese free-flight, four-engined flying boat that we first mentioned in the July FN. Built by Minoru Sato, designer of Mamiya engines, this unique ship has four Mamiya .09 engines, two tractors and two pushers, arranged, as will be seen, in tandem pairs in nacelles mounted close inboard on the wing. These engines are synchronized in left and right pairs by means of a coupled fuel system, utilizing polythene diaphragms each controlling the fuel to the opposite engine and actuated by pressure tapped from the crankcase. Thus, if one motor begins to lose power or stops, both motors will be stopped immediately to prevent a spiral. Model is now scheduled for conversion to RC.

From O.S., comes a further modified version of the well-known Class B/C Max-1 engine. This has an improved crankcase and is adaptable to speed control by means of an exhaust butterfly coupled to an intake flap. Neat appearance of the fitment can be seen in the photo.

Sweden

A perfect score of five maximums in International free-flight or in Wakefield rubber is not infrequent in top class contests, but in A2 Nordic glider it is something less common and, when Gunnar Kalen returned a perfect five in the recent third International team eliminator, at Ljungbyhed over Whitsun, this was, we are told, the first time a five-flight max had been recorded in this class in Sweden. As a result of the contest, Sweden's team members chosen for the World Glider Championships, Czechoslovakia, were Gunnar Kalen, Rolf Hagel, Stellan Knoos and Gosta Nilsson. Incidentally, Swiss A2 expert, Hans Thomann, now working in Sweden, made his debut in Swedish modeling by winning the A2 class at the previous eliminator held at Norrkoping.

A new Swedish speed record was recently established when Kjell Rosenlund of Stockholm achieved 186.7 km./hr. (116 mph) in the .15 class using a Super-Tigre G.20 motor.

Czechoslovakia

We have been testing one of the new Czech Vltavan .29 racing engines. This is a production version of the MVVS motor previously produced only for Czech speed teams by the state-sponsored model research center at Brno. Motor is in the classical racing engine tradition to twin ball bearings, disc valve and aluminum, ringed piston. Looks like a Dooling.

In Brief

England . . . Biggest treat in years for British modelers was when Howard Bonner and Bob Palmer broke their homeward journey from South Africa to put on a quick show in England. Everyone still talking about it. Demonstration, incidentally, was part of a C/L and RC rally in the grounds of Woburn Abbey, home of the Duke of Bedford and one of the many English "stately homes" which, in these days of crippling taxation, now have to earn their keep by opening their gates to the public.

West Germany . . . Walter Fritsch has a new WAF engine on the way: .20 cu. in. with throttle control and built-up pressurization system for pneumatic RC servos. After a rash of new types a couple of years back, few new engines are appearing in Germany just now.

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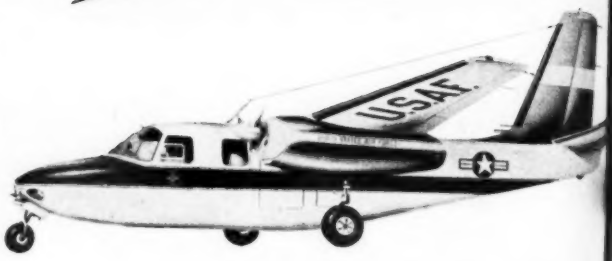

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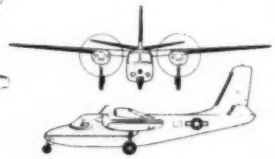

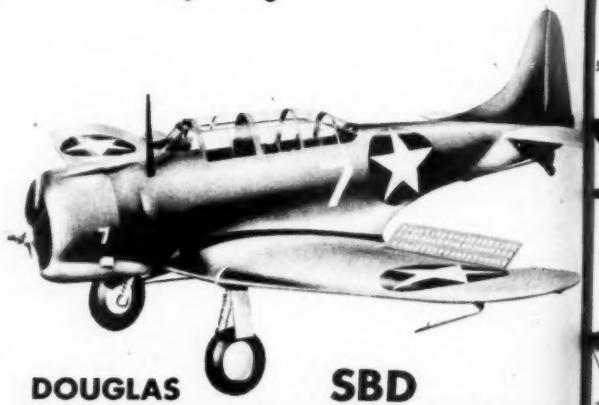

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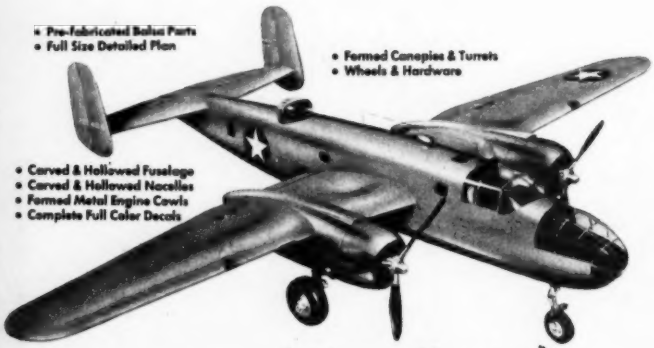

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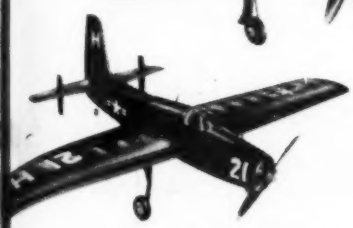
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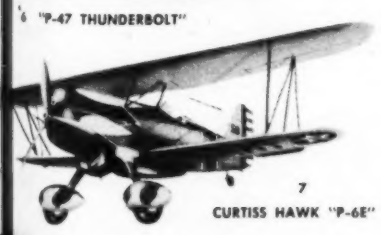
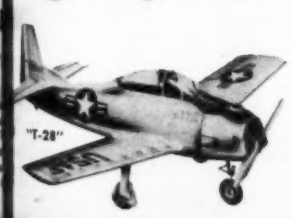
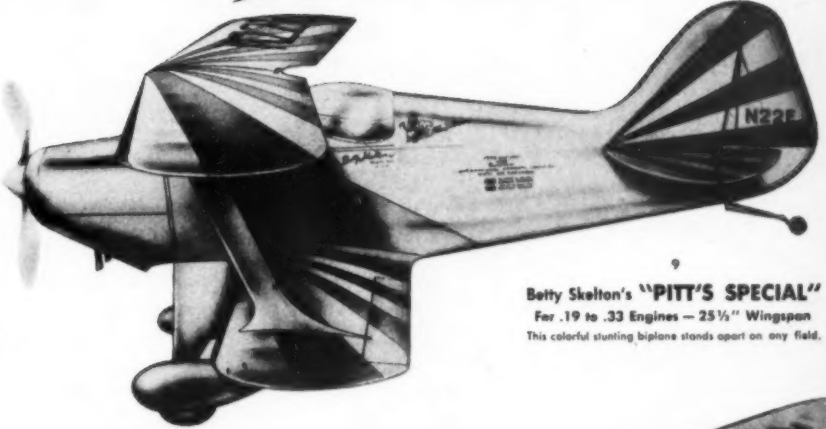
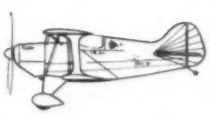

7
CURTISS HAWK "P-6E"


"T-28"


9

Betty Skelton's "PITT'S SPECIAL"
For .19 to .33 Engines — 25½" Wingspan
This colorful stunting biplane stands apart on any field.




10 CESSNA "195"


11
"T-34-A MENTOR"


12 "SHOESTRING"


13
"AJ-1 SAVAGE"


14 "MINNOW"

1 **North American "P-51 MUSTANG"** **$5.95**
For .19 to .36 Engines — 37" Wingspan Kit No: 5-1
Retractable Gear; Flaps; Rudder; Elevator Control

2 **Grumman "F-8-F BEARCAT"** **$4.95**
For .29 to .65 Engines — 35" Wingspan Kit No: 5-3

3 **Grumman "GUARDIAN" Semi-Scale** **$7.95**
For 19 to .36 Engines — 53" Wingspan Kit No: 10-2
Metal Cowl; Designed for Stunt and Navy Carrier

4 **"P-40 WARHAWK" Semi-Scale** **$6.95**
For .19 to .35 Engines — 45" Wingspan Kit No: 10-1
Metal Cowl; Stunt Flaps; Flying Tiger Decals

5 **North American "AT-6 TEXAN"** **$4.95**
For .19 to .33 Engines — 31" Wingspan Kit No: 6-1
Metal Cowl; Embossed Canopy; Army and Navy Decals

6 **Republic "P-47 THUNDERBOLT"** **$4.95**
For .29 to .65 Engines — 41" Wingspan Kit No: 5-2
Automatic Wing Flaps; Engine Throttle Control

7 **Curtiss HAWK "P-6E"** **$4.95**
For .09 to .15 Engines — 24" Wingspan Kit No: 7-1
Metal Cowl; Metal Wheel Pants; Colorful Decals

8 **North American "T-28"** **$5.95**
For .23 to .36 Engines — 30" Wingspan Kit No: 6-2
Metal Cowl; Tricycle Gear; Step Keel Alignment

9 **"PITT'S SPECIAL"** **$5.95**
For .19 to .33 Engines — 25" Wingspan Kit No: 9-2
Metal Cowl; Metal Wheel Pants; Decal Flare Design

10 **Cessna "195"** **$5.95**
For .19 to .49 Engines — 36" Wingspan Kit No: 9-1
Metal Cowl; Step-Keel Fuselage Construction

11 **Beech "T-34A MENTOR"** **$5.95**
For .14 to .29 Engines — 33" Wingspan Kit No: 6-3

12 **"SHOESTRING"** **$5.95**
For .14 to .36 Engines — 28" Wingspan Kit No: 9-3
Metal Cowls; Spinner; Wheel Pants; Landing Gear

13 **North American "AJ-1 SAVAGE"** **$7.95**
Two .045 to .099 Engines & Jetex — 27" Span No: 8-1
Metal Cowls; Five Wheels; Carved Bodies, Nacelles

14 **"MINNOW" Cosmic Wind** **$5.95**
For .09 to .36 Engines — 28" Wingspan Kit No: 9-4
Metal Cowls; Spinner; Wheel Pants; Step-Keel

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BERKELEY MODELS INC.,
WEST HEMPSTEAD, NEW YORK, U.S.A.

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"Official U.S. Navy Photograph"

A WORLD RECORD

for Berkeley's

"PIPER CUB J-3"

Radio Control — Free-Flight — PAA-Load

"PIPER CUB J-3"

Pre-Fabricated

$9.95

Kit No. 2-2

For .15 to .25 Engines—72" Span—2" Scale
4½ lbs. — 700 Sq. In. Wing Area — 14.2 oz. Loading

- Shock Mounted Wing Panels
- Rudder-Motor Control
- Fully Detailed, Authentic
- Optional Elevator Trim

The "Piper Cub J-3" needs no introduction. Most famous of all light aircraft, it is a natural for the R.C. or Free-Flight flyer. Almost six feet in span, perfect for those extra R.C. installations you've been dreaming about. It's a rugged, high performing, thoroughly flight proven scale design.

"Official U.S. Navy Photograph"

"Official U.S. Navy Photograph"

PRESS RELEASE

National Championship Model Meet

N.A.S. Willow Grove, Pa. - 28 July thru 4 Aug. 1957

NATIONAL MODEL MEET HEADQUARTERS July
FOR IMMEDIATE RELEASE
FOR INFORMATION CONTACT LCDR SCHUH
OSborne 5 - 7070, EXT. 303

The Russians lost another world record this morning at the National Championship Model Meet at Naval Air Station, Willow Grove, Penn when Verne Kroamer of Sellersville, Pennsylvania flew his radio-con J-3 model Piper Cub airplane from Turner Airport to the Naval Air St a distance of four and one-half miles.

The previous record, established behind the Iron Curtain in August was set at 1.49 miles.

It was on just such a morning as this that Lindberg took off from Ne in quest of another record. The fog was just lifting from the fields green by yesterday's rains, and the air was quiet with little current the control car sped through Montgomery County, Pennsylvania with model riding easily about 500 feet above the car and slightly ahead. times the speed of the model reached nearly 60 miles per hour.

The event was observed by the official Federation Aeronautique Int nationale observer Carl Wheeley of Washington, D.C., who will corr the findings of the new world record.

Vernon Kroamer is an electronic scientist with the Naval Air Develo ment Center at Johnsville, Pennsylvania.

The weight of the model plane without fuel was six and one quarter to which the fuel added another weight to bring the total weight to pounds nine and one quarter ounces.

- U.S.N. -

We are proud a Berkeley design w chosen for this record attempt!

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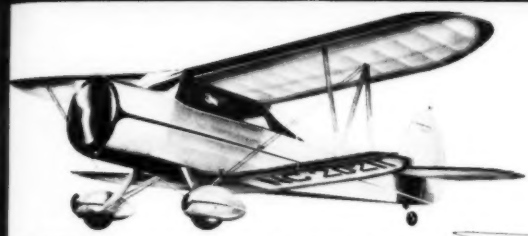
ANNOUNCING TWO NEW MODELS:

Berkeley's CHAMPIONSHIP "1/2 A" FLYING SCALE

1" = 1' Scale . . . For Free-Flight . . . Controline . . . or Rubber Power!
For .035 to .049 Engines Free-Flight . . . .049 to .099 Engines Controline (except as noted)



"WACO CABIN"

For ½A Free-Flight — Controline 1" Scale — 35" Wingspan

For "½A" Engines — .035 to .074

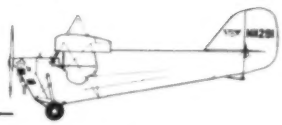
An unusual addition to our line of 1" Scale Championship designs. The "Waco" is easy to adjust and an unusually stable and high performance craft. As a Controline, its scale appearance and perfect proportions team up to make a fine flyer for everyday or Contest Flying Scale events.

Kit No. 4-13 **$3.95** less wheelpant material

AERONCA "C-3"

For ½A Free-Flight — Controline 1" Scale — 36" Wingspan

.020 to .051 Engines



Kit No. 4-12 **$2.50**

This kit now joins other Berkeley 1" Flying Scale designs, a series which has won this event at the Nationals consecutively since 1938. Structurally simple, the "C-3" can be assembled and flown in a few days time. Flies well with high or low power free-flight or controline. Plans show both types.

- Authentic Multi-color Decals
- Formed Gear, Rubber Wheels
- Die-Cut Balsa and Plywood Parts
- Metal Hardware and Covering Material
- Full Size Berkeley Detailed Plans!

$2.50
Kit No. 4-3

CESSNA L-19 "BIRD DOG"

36" Wingspan

Two seat observation plane used on a large scale in Korean War by the U.S. Army and the U.S. Marines. A large number of these are used by National Guard units. Powered by 213 h.p. Continental—130 m.p.h.

Kit No. 4-1 **$2.95**

PIPER "SUPER CRUISER"

35" Wingspan **$2.95** Kit No. 4-9

Three place cabin monoplane originally introduced as the "Cruiser" in 1940 with 75 h.p. then as the "Super Cruiser" after World War II, with 104 h.p. and then in 1948 as the four place "Family Cruiser". "Super Cruiser" had a maximum speed of 115 m.p.h.

STINSON SENTINEL "L-5"

33½" Wingspan

Two place liaison and observation plane first flown in 1941. 1731 L-5's were built during World War II. Still in use by the U.S.A.F., Italian Air Force, and the Japanese Air Defense Force. Powered by 190 h.p. Lycoming. Maximum—129 m.p.h.—112 m.p.h. Cruising.

CESSNA "180"

35" Wingspan

Four place cabin monoplane introduced in 1953 using same wing as the "170" but with a re-designed body and tail unit. Powered by a 225 h.p. Continental Engine. Maximum speed is 163 m.p.h.

$2.95
Kit No. 4-7

FAIRCHILD 24 "RANCHER"

36⅓" Wingspan

First produced in 1933 as a two-seater, in 1938 was introduced as a four place model using either a radial Warner engine or an in-line Ranger. Military version was known as the YC-61 "Forwarder" by the U.S.A.F. and the "Argus" by the R.A.F. Production resumed for business use after the war. 132 m.p.h.

Kit No. 4-5 **$2.50**

"AERONCA SEDAN"

34" Wingspan

Featured as a landplane, plans show pontoon details for those desiring the added thrill of water take-offs. Finished model is really spectacular

$2.50
Kit No. 4-8

"SUPER CADET"

35" Wingspan

Known as the "Interstate Cadet" before World War II and currently built by Call Aircraft Co. Two place—power was 65 h.p. It is now stepped up to 125 h.p. with an increase in maximum speed to 135 m.p.h.

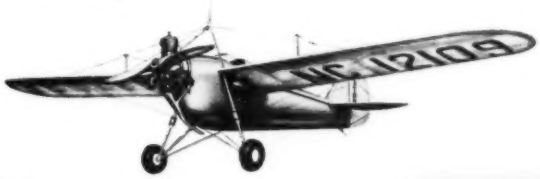
Kit No. 4-6 **$2.95**

$2.50
Kit No. 4-2

STINSON VOYAGER "150"

34" Wingspan

Originally built by Stinson division of Consolidated Vultee. Added to the Piper line in 1948. Four place 165 h.p. Franklin engine. 162 m.p.h. maximum speed.



"BUHL PUP"

1¼" Scale — 37½" Wingspan

Kit No. 4-10 **$2.95**

The "Buhl Pups" have been immortalized as one of the finest light planes ever designed. A number of full scale "Buhl Pups" are being rebuilt by "old timers". This truly different design makes an exceptionally realistic and fine flying model.

COLONIAL "SKIMMER"

(Not for Rubber Power) 33½" Wingspan

The hull design is perfect for realistic water take-offs.

Three place amphibian with retractable landing gear. Nose wheel protrudes when retracted to serve as a bumper. Powered by 125 h.p. Lycoming, 125 m.p.h.

Kit No. 4-11 **$3.50**

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Each year from all over North America, the top Scale Model Builders come to the Nationals . . . to fly in the exacting Flying Scale Event where models are judged for workmanship, authenticity and most of all — flying performance! Against this keenest of competition, Berkeley's Flying Scale designs have won 1st or 2nd in this event

at every Nationals' for the last 18 years!!

We are proud of this extraordinary record

ENGINES RUN CLEANER, LONGER... AT FULL POWER with new

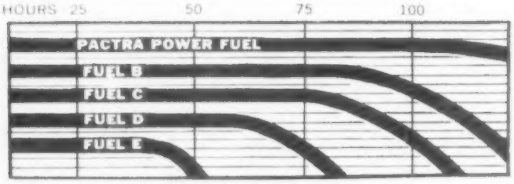
Announcing pactra POWER FUEL

Containing LUBEX 27!

When your engine is *new* and *clean* you get peak power from any popular fuel. But what happens after 50, 75, 100 flying hours? That thrilling surge of power begins to fall off, doesn't it? You know, of course that varnish, sludge and residues left by the fuel have accumulated on engine parts and caused this power loss—*but what to do about it?*

This was the problem faced by Pactra chemists when they accepted the challenge of producing a *truly different* fuel... one which would not only keep that power curve from declining for a longer period of flying, but actually project a much longer FULL POWER life than modelers are now getting from their engines.

Did they do it? Just take a look at the performance chart!



Compare the FULL POWER curve of Pactra Power Fuel—with Lubex 27—against those of 4 other leading fuels! Then—get just *one* can of Pactra Power Fuel. Watch Lubex 27 go to work, bringing back *new engine* efficiency and power... watch it stay there for flying hour after flying hour... month after month of clean-running FULL POWER!

Look for the Pactra Counter Refueling Station... at your dealer's. It contains the fuel that prevents over-heating, seizing, scored pistons—prolongs engine life and POWER!

Pints	Half Pints
98¢	59¢

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